ARCHIVES OF OPHTHALMOLOGY.

DISTURBANCES OF VISION AND UTERINE DISEASES.

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MANY women who suffer from eye diseases have an instinctive conviction that their eye trouble is in some way connected with the physiological processes of their menstruation. Before the introduction of the ophthalmoscope, the pathogenesis of such a relation was so little understood, that it is not to be wondered at that for a long time it was entirely discredited. It is the tendency of modern ophthalmology to seek a local cause for all disturbances of vision, and to use local treatment exclusively, but this has not met with the unqualified approbation of practising physicians.

It has always been insisted on, and in later literature again pointed out by Baumeister,[1] that there are "untold numbers of women who have disturbances of circulation from abnormal conditions of menstruation without any corresponding disturbances of vision." Of course this is an undeniable fact, but still it does not prove anything positive, since how many people have contracted severe colds without having had pneumonia or rheumatism; and how many workmen lie down to rest on the damp ground without contracting myelitis. We are not to ask the question, why does not the same cause always produce the same effect in the system? It would be much more important to

[1] *Klinische Wochenschrift*, No. 48, 1876.

know to what extent any local morbid process can affect the one or other part of the general system. Menstruation and its anomalies have been shown by innumerable observations to have the power of deleteriously affecting any part of the eye.

It happens not infrequently that, in a patient who has undergone a cataract operation, the eye which had had no previous anomaly becomes suddenly irritated, even two weeks after the operation, on the advent of menstruation. Such irritation sometimes causes a low degree of iritis. It should be especially remembered that such conditions occur even where the menstruation has been perfectly regular, since they show that disturbances of circulation, finding in the fresh wound a place of diminished resistance, are apt there to cause increased irritation, or even a new inflammatory process.

Such being the case under normal physiological conditions, pathological processes would certainly be rendered so much more potent when working under the same influence. I do not mean to say that the disturbances to circulation resulting from menstruation are always the *causa movens* of eye disease, but that they may be an aggravating factor in an eye trouble which depends upon a condition with which the function of menstruation has not the least connection.

Some years ago a young lady consulted me on account of an interstitial keratitis of both eyes. It had increased so much at her time of puberty that she was obliged to keep her eyes closed for days on account of pain and photophobia. Between her periods they were better, so that she was able to open the lids for half an hour toward the evening of each day. Since her childhood she had always been under the care of a doctor. Before her puberty the inflammation sometimes subsided for weeks at a time, but at this turning-point of her life, instead of getting better it got very much worse. My diagnosis was that she had congenital syphilis (from her father), or that she had contracted it from vaccination. Notwithstanding the anæmic condition of the patient, and her scanty menstruation (regular), she was im-

mediately put under a systematic treatment by inunctions. She was also treated internally with ferrum citr., and, besides, before each period she was ordered one half teaspoonful of elixir propr. Paracelsi twice daily. Her eyes were treated with cataplasms for one hour every evening. As the vascularization of the cornea was done away with by this treatment, eserine was dropped into the eye to clear up the opacities. After three months she was perfectly cured. As an after-treatment she was ordered to take a tablespoonful of iron and cod-liver oil every day throughout the winter, with small intermissions. Since then she has had no inflammation not even at the time of her periods.

A very large number of observers agree, that in inflammation of the external tunics of the eye, conjunctiva and lids, there are exacerbations simultaneous with the occurrence of menstruation. Why it is that this occurs in some cases and not in others, we cannot explain. It is, however, a fact, which no ophthalmologist, who has any claims to be called a circumspect therapeutist, can fail to appreciate. If a physiological fluxion which lasts such a short time can have such an influence, a pathological condition of menstruation must have an infinitely greater one, and, indeed, we find it so. Nothing could be more suggestive than the fact, that in young girls who have chronic trachoma, we sometimes see at the time of their molimina menstrualia a new crop of trachomatous granules spring up, even if the menstruation is irregular or very scant. I distinctly remember the case of a girl of 14 years who had an intense keratitis pannosa, and, notwithstanding the fact that every symptom of her molimina menstrualia was present, she could not be brought to menstruate, but, nevertheless, had such an inflammation every four weeks, that a whole year's treatment had not the slightest effect. When her menstruation did occur every thing was changed, but the tissue of the cornea of the right eye was so transformed, that the cornea, although transparent, remained a very irregular cone.

To show the enormous importance of this physiological hemorrhage I will relate the case of a strong country

woman who consulted me in 1857. She was 28 years old at that time, and had never menstruated on account of an arrest of development of her uterus. Every month her face became very hot and swollen. She had had interstitial keratitis in both eyes since her 15th year, which had withstood all treatment, and which was much worse every four weeks, remaining so for several days. By the use of strong emmenagogues and Friedrichshaller bitter-water, she had a very insignificant menstruation a few times in succession. It was astonishing to notice the effect; she was freed of her pain and photophobia as if by magic. This condition lasted only 12–14 weeks: notwithstanding every conceivable medication her menses did not return, and the eyes relapsed into the same condition in which they had been for 13 years.

Diseases of the sclera are always more prevalent in females, and even though the etiology of episcleritis is very obscure, from the fact that it happens so frequently in women, we may draw the conclusion, that it stands in some relation to diseases of the uterus. One thing is certain, viz., that the occurrence of a menstrual disturbance prolongs the course of an episcleritis, and even induces a complication of iritis. I have seen a case in which I was forced to consider that a metritis and a change in the position of the uterus brought on an attack of episcleritis. The patient was 45 years old. Her right eye became affected at the time she was undergoing a treatment for retroflexion of her uterus, in which there was a tumor of its neck. Every time that the vaginal portion was touched, or a pessary was fresh put in, her episcleritis was worse, and she had intense ciliary neuralgia. The episcleritis was cured, and remained so for about a year, when she again had uterine trouble, and episcleritis occurred in her left eye, which got very much worse every time there was a local application to her uterus.

It is quite a widespread opinion that anomalies of menstruation have a deleterious effect upon some portion of the uveal tract. Without expressing any opinion as to whether this is the case or not, I would remark

that iritis occurs very much oftener in men than in women, because it is in the majority of cases the result of some external circumstance, as colds, traumata, etc. Inflammation of the iris as the result of menstrual disturbances is comparatively rare; it is more frequent in anæmic individuals when the menses have been stopped by exposure to cold. Menstrual disturbances are much more potent when synechiæ have already taken place from pure iritis, or iritis which has resulted from choroiditis; and even in such cases we seldom observe any direct increase in the inflammation, but rather such complications as hemorrhages into the anterior chamber, and still more frequently temporary obscurations in the field of vision during the menstrual period. * * * According to my own experience I would say that of all the eye affections, of choroid, retina, optic nerve, etc., there are none which are not influenced either by the normal or pathological workings of the uterus.

Dr. Ludowigs has taken the pains to prepare statistics from

No.	Name of Disease.	Men.		Women.	
		I	II	I	II
1	Morbus Basedowii	—	—	—	2
2	Episcleritis	2	—	8	1
3	Keratitis interstitialis	8	8	12	16
4	" profunda	2	3	11	9
5	" punctata c. iritide serosa	—	—	6	1
6	Iritis	12	—	16	1
7	Irido-choroiditis	10	9	12	22
8	Choroiditis latens	3	3	3	4
9	" glaucomatosa	3	1	1	—
10	" dissem., areolaris, atroph.	6	1	5	4
11	Myodesopsia	—	8	8	13
12	Obscuratio corporis vitrei	4	—	9	3
13	Hyperæsthesia retinæ	1	4	—	10
14	Hyperæmia ret. vel nervi optic. e. menstruatione irreg. vel hyperæmia meningiali	1	5	5	31
15	Apoplexia capillaris retinæ et choroideæ	8	—	11	1
16	Solutio retinæ	33	3	18	2
17	Amblyopia e metrorrhagia	—	—	2	3
18	Neuritis optica et neuroretinitis	5	7	6	23
19	Asthenopia ex anæmia	—	5	—	40
20	Insuff. m. recti int. ex anæmia	7	—	17	—
	Total	162		336	

the various cases of my clinic, in order to find out what kind of cases could be attributed to uterine trouble. Among 5,507 new patients, who presented themselves from January 1st to December 31, 1880, there were 2,907 men and 2,600 women; children and adults together. All cases in which lues or traumata had been present were not counted. In the foregoing table will be found those cases of spontaneous eye troubles from the beginning of puberty, tabulated as to whether they were one-sided or bilateral.

A comparison of this table shows that such affections happened in 162 men and 336 women, or 32⅓% men and 67⅔% women. Even if we do not wish to enter more fully into the etiological details, the table shows beyond doubt that there is a predisposition on the part of women to such diseases.

According to the combined evidence of the whole medical world, the majority of physiological and pathological phenomena in women depend upon the functions of the uterine system. It is also a fact that the irritation of any sensitive nerve not only acts in a reflex manner on other nerves of the same or different energy, but causes a determination of blood to, or the emptying of, certain vascular systems to which the irritated nerve has no relation. This is true to such a degree that no physiologist can say *a priori* to what an extent a primary irritation will go. It may therefore happen that even an irritation or inflammation of the mucous membrane of the vagina may have an influence in producing a retinal hyperæsthesia or an accommodative asthenopia. If I may so express myself, not only the intensity of the local affection, but also an individual predisposition certainly have a great influence in bringing about such secondary pathological disturbances. We may put it down as a general rule, that genital affections and general morbid processes have an influence on the condition of the eyes, and so much more if they find them already inflamed. Again, if the simple introduction of a speculum can cause a visual disturbance, as has been often observed, it would be but natural to suppose that masturbation, which is analogous to it, should have very decided influence in bringing about

serious eye trouble. As an illustration, I may cite the case of Miss N., 24 years old, who confided to me, with a great profusion of tears, that she had practised Onanism since she was 15 years old. Her loss of power of accommodation and photophobia had increased from year to year in such a manner as to have caused her great alarm. Her labia minora hung out like elongated cords. The clitoris was unusually large, and was so excitable, and could bring about such a dyspnœa, that I was obliged to advise her to have it amputated. In the case of a South-American lady who had been the slave of the vice since her early youth, there was an excessive hyperæsthesia, and her accommodation was paralyzed to such an extent that she had to use convex 6 to see near by. In addition to this there was an occasional sensibility of the ciliary body; she thought that objects receded from her, and were therefore much smaller than normal. The subjective complications which resulted from her condition were varying; sometimes she suffered from dyspnœa, at others she was anæmic and lost all power of accommodating for near objects, as if she had insufficience of the internal recti muscles. I have never seen a visual disturbance resulting from an acute vulvitis, nor from abscesses in the glands of Bartholini, but my experience in such conditions has been very small. I have seen such disturbances of vision as above described in cases of acne pustules which extended from the outer genital organs to the mucous membrane. I remember such a case in an unmarried woman of 30, in whom there was such itching that she had to get out of bed 4-5 times every night; in her case there was no other complication except a few psoriasis patches on the neck, fingers, and in the axilla. These I attributed to a constitutional syphilis of her remoter ancestors. The acne pustules and the constant scratching had produced such an inflammation of the mucosa that she could not stand a single soothing injection. After a continued use of morphium suppositories and warm water, she could tolerate weak solutions of carbolic acid, which, in connection with Fowler's solution of arsenic, made her life again bearable. We meet the same disturbances in pure pruritus

vaginæ, a disease which we may call a neurosis of the nervus pudendus, and consequently capable *a priori* of causing a retinal hyperæsthesia. I think also that vaginismus can also bring about the same condition. I have also seen visual as well as general disturbances produced by these excessively sensitive papillary swellings, which occur at the mouth of the urethra.

I know a Frenchwoman, slightly hyperopic, whose head was so sensitive that she could not wear spectacles. She could not use her eyes for any length of time, notwithstanding the fact that her sight was good. The ciliary body was nowhere sensitive, but the hyperæsthesia of the retina was so great that she could hardly enter an illuminated room. After having cauterized her angioma polyposum with cupr. sulp., and giving her pills of bromide of potassium and lupulin for several months, she was able to wear her glasses. I have found in my experience of 23 years that sometimes when a woman cannot wear her glasses, there is often a uterine complication.

These facts are sufficient to show how easily a relatively slight uterine disease can bring about a whole concourse of eye troubles. Indeed the patient is lucky if her eyes are not affected to a greater degree than was the case in those already mentioned, since there are infinitely more people in whom the reflex irritation brings about more important changes in the background of the eye.

The wife of a friend of mine suffered from a few very prominent glands of Naboth, and consulted me on account of a central choroidal exudation in her left eye, while in her right the sight was reduced to $\frac{1}{8}$, on account of sclero-chor. post. A few years after marriage she was put under the care of a prominent gynecologist, and on account of a small operation, and the introduction of a speculum, she suffered such pain in her back and legs, and finally obscuration of sight, that she lost confidence in him. She was dismissed from treatment, but advised to use quite a strong solution of warm salt water. After the first injection she could hardly move her legs; from the hip to the feet they were ice-cold, both subjectively and objectively, whereas the upper part of

the body was very hot. Simultaneously with this disturbance of circulation, she was often absolutely blind, for a few minutes at a time. Since the injections were continued, she had sensations as if the heart stood still, and again the sight was reduced: and a large detachment of the retina resulted. I did not see her until a few months after this had happened, when, on account of a perfect transparency of the vitreous, and a normally reacting pupil, I made up my mind to puncture the retina, if I could not do away with the source of irritation in the ovarian nerves. For this she was ordered: Kal. bromat., 4.0; lupulini, 6.5; pulv. rad. rhei, 1.5; extr. cent. min. q. s. to make 120 pills; 3 to be taken three times daily. At the same time the feet were covered with Priessnitz's bandages, in order to force the blood into the extremities by heat. On account of the heat in her head ice-bags were applied to the temples. This was continued for six weeks without any result, except a profuse uterine hemorrhage. I did not see her afterward, and was therefore not able to determine whether the hemorrhage was caused by an ovarian irritation or not.

I remember the case of a lady 26 years old, who said although she saw well she could not do her housework for ten minutes at a time. Formerly she had seen well in the distance, then she became near-sighted. She was treated with atropine; a hyperæsthesia of the retina intervened, which prevented her from mixing at all in society. She said that her symptoms commenced immediately after marriage; and that every cohabitation was excessively painful. Examination showed that there was a hard exudative mass in the right parametrium, which was attached to the body of the uterus posteriorly, and extended like a fan along the ligamentum latum. She was ordered a lukewarm injection twice daily, and in the evening an iodoform cotton tampon. She was also given bromide of potash for four weeks to do away with the reflex irritation. She had no local treatment except atropine twice daily, and after five weeks she was able to go about her usual work, but the myopia remained at $\frac{1}{18}$.

I saw her again in the winter, when the exudation was

much reduced in size, and was but little sensitive to the finger. Her general condition was very much improved. She was ordered iodide of potassium for the absorption of the exudation.

From a clinical standpoint, her symptoms were brought about by a reflex irritation from a parametric patch, which was much lessened by the treatment employed. I do not think that the condition of the eyes can be benefited when such an exudation has subsided into cicatricial tissue in the parametrium. Compare this condition with the kopiopia hysterica described by Förster and Freund.

I also remember the case of a lady 75 years old, who could not bear artificial illumination, which trouble she says commenced at her time of puberty; for 57 years she had always retired to a dark corner as soon as the lights in the house were lit. As in all such cases the sight was good, indeed I have never heard of a case in which the sight was materially reduced. According to Freund, the inflammation of the parametrium passes off and leaves a cicatricial condition, and produces irritation along the broad ligaments to the walls of the pelvis, the cellular tissue of the rectum, the bladder, etc., and the nerves connected with these parts. In the same way as a parametric exudation or its results produces such irritation, so can a similar condition of any of the soft parts around the uterus. I know of a lady who had during her first delivery suffered a rupture of the perineum, followed by considerable sinking of the womb. She had four children, and with each delivery the defect was increased. When I examined her, her sight, field of vision, and color-perception were normal, but there was such a spasm of accommodation, and hyperæsthesia of the retina, that she could attend to none of her domestic duties. There was a slight improvement from atropine, but I was obliged to tell her that no medication would cure her unless she had the perineum operated on.

All conditions which tend to narrow the orifice of the uterus can have the same results; therefore we see hyperæsthesia of the retina in cases of dysmenorrhœa. As an illustration, I know of a young lady, 21 years old, in whom

the uterus was as small as an infant's, and she suffered from the most pronounced retinal hyperæsthesia. This form is most often met with in congenital stenosis of the orifice, when the small opening empties into a contracted vagina. It is seldom in this condition that we do not find increased retinal hyperæsthesia at the time of the scanty menstruation. I have seen such cases, and also the same condition, in two cases of tumor of the uterine walls, and again in uterine displacements.

To put the whole thing in a few words, we can say that any inflammatory process in any part of the genital tract, causing alterations of its shape or dimensions, can produce a hyperæsthesia of the retina; this being once produced may bring about a variety of other conditions. In the lower degrees of hyperæsthesia the patient complains most of myodesopia, whereas in the higher ones they have subjective flashes of light and troublesome after-images. When the condition lasts a long time a narrowing of the field of vision is almost a constant symptom, even where there is no material diminution of sight. Then, again, the central vision can suffer very much, while there will be but little narrowing of the visual field. Again, the whole thing may result in a torpor retinæ. Stephan has shown that these two conditions are stages of the same disease. I once treated a girl of 17 who had stuck a pen in her little finger, and a very decided retinal hyperæsthesia manifested itself. She then had tetanus, and after she recovered it was changed into pronounced anæsthesia optica. Under proper treatment the whole condition disappeared. In this case, during the first stage, the central vision was much improved by wearing a dark blue glass, whereas in the latter stage such a glass reduced her sight very much.

It seems also that such reflex retinal irritations can bring about disturbances of circulation in the optic nerve, retina, or even the brain, since it can hardly be called an accident that in such conditions we often observe a hyperæmia of the papilla, or that a patient should complain of constant headache. It is of no moment whether the hyperæmia is an active one, or whether it is brought about by relaxation of

the vascular walls, as in some cases of metrorrhagia. In the latter case we sometimes find hemeralopia superadded on account of the condition of the retina.

Landolt assumes four conditions of visual disturbance in cases of ovarian irritation described by Charcot.

I.—The eyes show no objective symptoms, neither externally nor ophthalmoscopically. The two eyes differ, however, on functional examination. On the well side vision is normal, but there is a narrowing, and especially of the color field. The eye on the diseased side shows a diminution in all the retinal functions to an equal degree.

II.—There is a second condition or stage in which the objective symptoms are more pronounced on the diseased side, when they commence to appear also on the well side.

III.—In those cases where the retinal functions are very much reduced, viz., where fingers can hardly be counted, and the field of vision is reduced to within a few degrees of the point of fixation, the ophthalmoscope shows a distention of the retinal vessels with a serous transudation.

IV.—Once he found a partial atrophy of the optic nerve of both eyes in addition to the foregoing symptoms. I have often seen a commencing atrophy after a long-standing retinal hyperæsthesia. It is not even very rare that we see a detachment on one side brought about by a congestion of the head, from ovarian reflex irritation of the vagus. Last winter I had a patient who presented the whole complex of symptoms from this condition, as follows: She was unmarried, and her menses were always scanty; they sometimes lasted less than two days, and were always very painful. Her general condition was good. In the right eye she had anæsthesia of the retina, with a rosy injection around the papilla. She could only read Jæger No. 3, and her field was concentrically limited to four and a half inches. She had lost her sight in the left eye a number of years ago; it showed advanced atrophy of the nerve and a partial detachment of the retina. Centrally she could still count fingers at 2–3 feet; she did not recognize red or green. After a long treatment the sight of the right eye was restored.

We frequently meet with mydriasis, sometimes single,

sometimes double-sided. In the case of an excessive hyperæsthesia with scanty menstruation in my practice, it was bilateral. There was also great tenderness near the 2d and 3d dorsal vertebræ: the ophthalmoscope showed nothing. After five months the pupils returned to their natural size. In another case the same symptoms were induced by an epithelial exfoliation in the vagina; there was great hyperæsthesia and hyperæmia of the retina, with great reduction of sight; it lasted almost a year. She had a relapse, but her vision was not so much reduced as before, but the condition remained the same for four months. A third case was the fault of endometritis, a fourth of parametritis. In both of these the mydriasis was one-sided; the former of these was cured, the latter not. A fifth case came from retroflexion and had hyperæsthesia retinæ on both sides, with great contraction of the visual field; mydriasis only in the right eye.

I have observed only one case of myosis; it was in a woman 68 years old, who had prolapsus uteri; the condition had existed for years without any paralysis of the legs or bladder. There was a very slight atrophy of the optic nerve. With convex 11 she could read the finest type. I can only explain the myosis by considering that there was a paralysis of the sympathetic nerve.

Heretofore we have only considered the effects of the chronic diseases of the uterus. The acute ones are sometimes even more dangerous to the eye, since they not only act mechanically, but are also accompanied by high fevers. I have seen even a pneumonia or a pleurisy with a lasting fever of 39.5° cause retinitis, choroiditis, and fine opacities in the vitreous. How much more dangerous would we expect an acute parametritis to be, since, independent from the very high fever which accompanies it, the locality of the disease is in the immediate vicinity of the ovaries, where an irritation may cause all kinds of circulatory disturbances. I have seen grave results of such cases in my practice, resulting in detachment of the retina, etc.

Capillary hemorrhages resulting from neuro-retinitis are not important in themselves, simply expressing some im-

pediment in the retinal circulation. They are much more astonishing when they occur spontaneously from some pathological process in the internal genital organs. In this case they represent an increased blood pressure, caused by reflex irritation of the vagus from exudations or anomalies of position of the parts in subperitoneal cavity. I have seen such hemorrhages resulting from a prolapsus uteri.

The cause and pathogenesis of a certain kind of retinal apoplexy which we see in German factory women is, again, the expression of an eye complication in pernicious fever. I have never seen a case of this kind which could be traced to a uterine disease, and it seems to me that this form is a special result of a general disturbance. In this disease there is a peculiar blank expression of the face; respiration and the heart action seem to be carried on with difficulty. In such condition retinal hemorrhages occur in the majority of cases in both eyes, and are arranged in streaks along the larger vessels. In some instances we see small extravasations, but generally there are large irregular placques. The danger to sight increases according to their proximity to the macula lutea. If they do not cause primary destructions of tissue they may be absorbed, and the function of the retina perfectly restored at the seat of extravasation. However, there are always certain pigment masses left, but besides these pigmented spots the retina always clears up.

I have observed 10–12 cases of this form in which there was a horizontal defect in the field of vision, generally below, which went almost to the point of fixation, but in no case implicated it. The retina had not suffered any material change, and we are therefore forced to conclude that the disturbance was caused by a small hemorrhage in the intravaginal portion of the optic nerve, which caused a temporary compression. This form of hemorrhage can not be said to be restricted to females, but at the same time it happens very seldom in men, probably not in more than one in six cases. I do not remember a single case in which all the symptoms did not rapidly disappear. It was double-sided in only two cases. A sector-like defect is much more

serious, since I have seen no case in which it was completely cured. It frequently happens on one side as the result of some disturbance of circulation coming from the uterus, but when it is bilateral it is more probably the result of softening of the brain, in which it is not unfrequently connected with Bright's disease of the kidney.

It must be conceded that the sudden cessation of the physiological functions of the uterus causes a venous hyperæmia, which on its part will bring about a stagnation of blood in remoter localities. In the same way, all such conditions as parametritic exudation, retroflection, anteflection, descensus, prolapsus, tumors, etc., must have an analogous effect upon the pelvic organs. In the upper part of the ligamentum latum we find the plexus pampiniformis, formed from the veins of the ovaries and the tubes, and also the uterine plexus, standing in the closest relation with the lumbar veins. These again connect with the spinal veins and those of the spinal cord, so that the one can bring about great circulatory disturbances in the others. The simplicity of the anatomical structure of the venous canals renders this so much the more easy. It is also an anatomical fact that the veins of the vertebral column are strongly developed, and communicate above with the occipital veins, which through the mastoid foramen communicate with the transverse sinus. A congestion of these veins must also cause pressure on all the nerve elements in their vicinity. In this way it will be seen that they bring about all those sensations of pain, burning, heat, or cold in the back, etc. Physiology teaches us that such abnormalities of sensation as are combined with visual disturbances, are the result of irritation of the posterior roots and cords. Pains in the back of the head and in the branches of the trigeminus are produced by a direct implication of the fibres of the cervical plexus, and by an irritation of the cervical roots of the trigeminus (Erb).

We must thoroughly understand these anatomical facts before we can appreciate how a venous congestion working on the occipital lobes can bring about a "fulminating attack of blindness" after a sudden cessation of the menses. According to Ferrier the visual centres are situated in the

so-called gyrus angularis. On account of the decussation a destruction of one gyrus would cause blindness in the opposite eye, and a destruction of both, blindness in both eyes. The cases of Pooley, Hirschberg, Huguenin, and Rosenthal are further evidence of the fact that in man the visual centres are situated in the occipital cortex, fibres of which pass through the corpora quad., geniculata, and optic thal. to the optic tract, and partially decussate at the chiasm. A rapid compression of these parts is sufficient to bring on a transitory blindness without any complication in the background of the eye. Samelson's case is a good illustration; a young woman of 21 had to work standing with bare feet in water at the time of her menses. The sudden menostasis caused a disagreeable sensation of pressure behind the eyes the same evening. Within a month she was completely blind. The ophthalmoscope showed nothing but a strong retinal reflex and a slight engorgement of the veins. In another week her sight returned. Samelson thinks there was a transudation in the orbit which compressed the optic nerve. Baumeister suggested, however, that this was not probable, because the mobility of the eye was not interfered with, and there was no exophthalmus. I agree, however, with Samelson in assuming that the process could only have been the result of a compression on the occipital lobes, caused by venous stasis. This view would also account for the orbital pain through excitation at the origin of the trigeminus. I have seen other such cases where there was terrible pain in some of the branches of the trigeminus. In one instance there was great pain in the ramus nasalis; in others, excessive secretion of saliva.

I remember, again, where a suppression of the menses did not interfere with sight, but affected the facial and abducens of the left, and the rectus internus nerve of the right eye. My diagnosis was a blood-extravasation in the posterior wall of the pons between the corpus olivare and restiforme on the right side. Such forms of amaurosis are, however, very rare: the blindness is either accompanied or soon followed by retinal transudation, but so long as it is the result of a rapid venous stasis and without paralysis of the sphincter,

pupillæ, we may hope for a speedy cure. As an example of how the optic nerve may recover, I will relate the case of a woman of 20, who had hemorrhoids in consequence of a disturbance of circulation produced by descensus uteri. She had retinal transudations 5–6 times; sometimes in one eye, sometimes in the other. At times she could only count fingers at 1′, and F was 10° perimetrically. She recovered her sight after every attack. I have often seen, however, that the neglect of such conditions has led to permanent changes in the retina.

Too much stress can not be placed on the venous character of the pathological process, since it is an essential element of prognosis, being entirely different from the class of diseases which are brought about by arterial hyperæmia. If we wish to express the whole thing in a few words we may say that the brain has become tired. Without saying that this happens only in girls who have been too severely worked at school, I would remark that, of all countries of the world, in Germany girls at the age of puberty are taxed the most at school. This is of itself a bad condition of affairs, but when it is connected with the trying of this particular age, it is much worse. I have often seen young ladies complaining of difficulties in vision without any change in the background of the eye, their condition having been looked upon by their parents or their family physician as simple asthenopia. Eserine would do away with the symptoms for $\frac{1}{2}$–$\frac{3}{4}$ of an hour, but after this they would come back. In the same way atropine would give great comfort, but only for a short time. In good illumination S is almost normal, but in subdued light S = $\frac{1}{2}$–$\frac{2}{3}$. F is complete. If the condition lasts a long time we find a slight hyperæmia of the papillæ, but this is often enough at the boundary of the normal. All the symptoms increase if the brain is much taxed, and, in fact, it can go as far as nausea and intense headache in the back of the head. Sometimes the patients are sleepless, sometimes they sleep involuntarily after eating, etc. In fact, all of their symptoms seem to point to a meningeal hyperæmia. As long as this is active, there are symptoms such as headache and excitability, but when it becomes passive the patient is apathetic.

We frequently see old women who have become gradually blind from atrophy of the optic nerve without having had any acute symptoms. The statistics of Lang (Hirschberg's clinic) and the observations of Rokitansky and Förster show that a continued hyperæmia of the brain leads to an exudation of crude gelatinous connective tissue, which when cicatrizing causes a destruction of nervous tissue in the brain and spinal cord. Rokitansky has demonstrated the same condition in the olfactory and optic nerves, in the spinal nerves, etc.

We can say that females are peculiarly predisposed to such conditions on account of their inability to stand much mental strain, their menstruation, and on account of the innumerable disturbances to circulation which diseases of the uterus induce. I have seen several such cases in my practice.

There is another type where disturbances of vision result from myelitic processes. Twelve years ago, a young lady consulted me on account of a neuritis optica duplex. She was lame on account of a retroflexion of her uterus, and the extremities of both legs were anæsthetic. The uterus was put into proper place by a pessary. From that moment her neuritis improved. Her good condition continued for several years, when she began to experience severe headache on one side of her head, and had double-sided mydriasis, when she was found to have another retroflexion with inflammatory symptoms. Since I have taken this case as a type, I would remark that a connection between diseases of the uterus, bladder, kidneys, and intestines and those of the spinal column has been made by older observers. The paraplegia makes it probable that myelitis had been developed. In order to explain the pathogenesis of such a condition, I would refer to Tiesler's experiments, where cauterization of the nervus ischiadicus caused symptoms of inflammation of the spinal cord, with consecutive paraplegia and incontinence of urine, without any inflammation of that part of the ischiadicus situated between its origin and the place of cauterization. Klemm's observation is much more important where he observed a spreading of the primary in-

flammation to the spinal cord. Also the most important fact, that the inflammation went into the cranial cavity, and could even pass from a certain nerve trunk to the corresponding nerve on the other side. According to Rumpf, where the vascularization of symmetrical portions of the body is in intimate relation, a change in sensibility is always the result of a variation in hyperæmia and anæmia of the surface of the skin. He also shows that even artificial hyperæmia of one side produces anæmia of the other.

That there is a myelitic process in the optic nerve under such circumstances, is not to be doubted, whether it occurs as an independent disease or as a secondary complication from the urino-genital or uterine system. In diseases of the uterus the plexus uteri and the nervi sacrales are the means by which the spinal cord becomes affected. It can first be a local affection in the spine, and afterward complicate the optic nerve directly or indirectly, through the general system. Again, the opticus may be complicated without the least appearance of inflammation in the spinal cord. Whether the optic neuritis is developed as above described, or by venous stasis, the anatomical damage does not result from the inflammation alone, but still more from the effect which the lymph congestion has on the axis-cylinders of the nerve fibres. Rumpf, who discovered this process, has shown that an absorption of the axis-cylinders can thus take place. The first to show such a result in the optic nerve was Kuhnt.

As Cohnheim has demonstrated, the lymph vessels serve as a means to carry off all transudation from the blood-vessels. The greater the venous stasis the more important the lymph passages become, and at the same time the less they are able to carry off transudations, so that œdema is the result. Thus it happens that every optic neuritis can develop into a true neuro-retinitis by an extension of the accompanying œdema. The acute forms of neuro-retinitis which we see so often after excessive hemorrhages in abortion, placenta prævia, ovarian tumors, etc., are almost always characterized by the bad effect they have on the sight. We must not forget that a loss of blood causes a diminished heart action, which in a weak constitution may cause much

damage in the optic nerve and retina. Thus primary retinal anæmia will cause serious transudations in the neighboring tissue as an anatomical necessity.

The destructive influence of transudations on the axis-cylinders is thus rendered very great, and the retina and optic nerve soon show it in consecutive atrophy. There is another kind of neuro-retinitis, setting in as an acute affection, but running, as it were, a latent course, ordinarily termed atrophy after hæmatemesis. It differs in its local symptoms at the papilla from ordinary neuro-retinitis, but its nature is the same. The sudden loss of blood is the essential cause, the ulcus ventriculi is accidental, as it occurs just as frequently after abortion and metrorrhagia. The emptying of the blood-vessels destroys the function of the retina so rapidly that blindness comes on either at the time of the hemorrhage or immediately after it. A few hours later, there is a slight serous transudation at the papilla, and occasionally small hemorrhages in the region of the clouded zone. This agrees with the fact that a few hours after an excessive loss of blood, we find a collateral œdema and also extravasation of red blood corpuscles. The transudation disappears in a few days, and if there is no blood to be seen, no vestige is left to point to the pathogenesis of the affection. It appears also that an interruption of circulation during a few days is quite long enough to render the retinal arteries impervious forever, otherwise we could not understand why such a process causes permanent blindness. In some cases the blindness is not sudden, but the nerve atrophies slowly. The quantity of the loss of blood, and more or less personal power of resistance, determine the extent of the damage to the eye. All extensive hemorrhages have an effect on the sight, sometimes only in the shape of accommodative or muscular asthenopia, sometimes in contraction of the range of accommodation; again, in diminution of vision, either transitory or permanent. They may also cause hemeralopia. With the ophthalmoscope we sometimes see an enlargement, sometimes a contraction of the retinal vessels. In fact we meet with all kinds of changes, from a simple transitory impairment of vision to a progressive atrophy of the optic

nerve. A constant fact is that a previous myopia always advances by the anæmia.

Of the same character are the disturbances which cause transient retinal transudations with rapidly disappearing amaurosis during pregnancy or shortly after delivery when the circulatory impediments lead to albuminuria.

If the loss of albumen from excessive hemorrhage has passed beyond a certain limit in reducing the vitality of the organism, the amblyopia may withstand all medication, the substance of the optic nerve waste away, and amaurosis be the ultimate result. I have seen the nerve atrophy to continue even when the primary cause was removed. Such an issue is particularly to be expected in weak constitutions, in which the action of the heart has been enfeebled by physical, moral, or social troubles. Anæmia of the brain with disturbance of sight may occur without hemorrhage in all conditions which cause great irritation of the contents of the abdominal cavity.

According to Litten, in a case of carcinoma uteri, the arteries and veins of the retina were not to be distinguished from one another, both being exceedingly small. The usual symptoms of neuro-retinitis, or pallor of the disc, etc., frequently accompanying general amblyopia, were absent. The changes in the background of the eye are, as a rule, not in proportion to the extent of the uterine complication, but to the extent of the anæmia. As evidence of this, Litten cites a case of total degeneration of the uterus with no change in the eye, whereas in another, where only the neck of the uterus was diseased, ocular changes were present.

It is remarkable that all the alterations in the optic nerve and retina from excessive hemorrhage are not accompanied by opacities in the vitreous. When these are present, we always find as their causes retinal hemorrhages, or disturbances of circulation in the uveal tract. They exercise an obnoxious influence on the nourishment of the lens system, favoring the development of cataract. I have published my experience on this point, stating that the formation of a nucleus was but little marked, the lens substance was semi-soft, and had a bluish-white tinge. The occurrence is so

constant that I consider such conditions as an indication of marasmus. It makes its appearance in the middle age of life after excessive metrorrhagia, or after many confinements. It occurs also in young women who during the period of lactation are affected with a transudation into the vitreous, followed by opacity of the lens, beginning at the posterior pole. Since the above publication, my further experience warrants me in saying with more emphasis, that a loss of albumen leads to a hydræmic condition which not only brings on cataract, but also has an influence on its consistency. It is an old observation to find an issue of fluid vitreous in extracting such cataracts, and these eyes require the greatest care during the after-treatment, lest a supervening choroiditis do away with the good result of the operation.

Choroiditis disseminata occurs frequently in females whose menstruation is scant; this, however, is not the cause of the eye trouble, for we see the choroiditis in girls not old enough to menstruate. Their cachectic and anæmic condition, and their menstrual anomaly have a common cause—ancestral syphilis or scrofula. I believe that the maceration of the choroidal pigment results from a congenitally diseased lymph. There are cases, however, in which the eye trouble can only be referred to irregular or suppressed menstruation.

Chronic choroiditis with fine opacities in the vitreous is often connected with anomalies of menstruation about the times of puberty and change of life, yet not so frequently as to indicate a definite causal relation, as it is brought on oftener, perhaps, by injurious external and constitutional conditions. The tendency which the inflammations of the choroid show to extend to the iris has long been known, but I wish again to remark that the appearance of the menses almost never shows an exacerbation of the choroiditis. It commonly causes nothing worse than slight temporary obscurations of the field of vision, or small extravasations of blood into the anterior chamber.

Precipitations on the posterior surface of the cornea (keratitis punctata), which we see so frequently in serous iritis

and irido-choroiditis, depend, I think, in the majority of cases, upon menstrual anomalies or direct genital irritation. I have met with a number of such cases.

Chronic choroiditis frequently occurs in women at the climacterium or shortly after that period, as also in all those conditions of the uterus which result in a hyperplasia of its walls. They are included under the general term of chronic metritis. In this condition the uterus is enlarged, and becomes sensitive to the touch; the vaginal portion is sometimes enlarged, sometimes diminished in size, hard in some cases, soft in others, etc. All these conditions cause disturbances of circulation, and have a great influence on the eyes. These morbid uterine processes are very slow, and their consequences last a long time, so that it is not astonishing that just in this kind of choroiditis we notice the occurrence of glaucoma. For many years I have been aware of this pathogenesis, and stated[1] that notwithstanding the hardness of the globe the excavation was not marked. The background of the eye, especially around the papilla, is dull, red, and blurred; the vitreous is diffusely turbid from fine opacities; and the sight greatly reduced, with an extensive peripheric limitation of the field of vision. In such conditions the sooner iridectomy is done the better are its results. I was alone in this opinion for a long time, but lately many authors have come to the same conclusions, among whom I will only mention Mauthner. Choroidal congestions are the effect of the same cause, which we notice after a long use of atropine, namely: vaso-motor paralysis which leads to an increase in tension, with the single difference, that in the one case it is chronic and in the other acute, while the ultimate result is the same as far as the eye is concerned. I have seen similar consequences of vascular paralysis from contusio bulbi, and from commotio cerebri, producing glaucomatous choroiditis after a long time. It cannot be too often pointed out that in all of these conditions there is a certain abnormal sluggishness of the pupil. As I was formerly not so familiar with these things, the absence of an excavation sometimes induced

[1] *Ophthalmologische Mittheilungen*, Berlin, 1874, p. 53.

me to abstain from an operation, especially when the sight was much improved by Heurteloups. Under just such conditions I have been astonished at finding large excavations at a later examination. I have therefore made it a rule for such conditions to perform iridectomy, because it prevents their prejudicial influence on the vision, and also does away with many other annoying symptoms which I formerly did not suspect to have any connection with the increased pressure in the eye; I mean such symptoms as occasional occipital pain, cardialgia, dyspnœa, circumscribed sensibility of the spinal column, spasms of the bladder, and the like, which, as we shall see later on, have to be considered as reflex symptoms.

It has already been noted that the excavation in many cases had not yet occurred at the time of operating. The operation almost always improves sight, but the excavation may come on a few years later, even without diminution of the acuteness of vision. It therefore appears that excavation of the papilla and changes in the tension of the eye are not necessarily dependent on each other. It is remarkable that I have never seen such high degrees of insensibility of the cornea in this glaucomatous choroiditis as in true glaucoma. This may, however, be accidental. Several times have I seen the development of keratitis glaucomatosa, both after iridectomy and (twice) after extraction of cataract. In rare instances the primary disease increases to the gravity of a glaucomatous chorio-iritis. The more quickly this form develops, the more dangerous it is.

Hirschberg's observations on metastatic choroiditis after septic puerperal embolism seem to be exhaustive. The eye complications all occurred at a time when the general condition was not yet very bad. The six cases which he reports, as well as the six cases which he cites from Hall and Higgingbotom, terminated fatally. In one case only (Martin's), the patient recovered, but lost one eye. I remember three cases of my own practice, in two of which both eyes were lost, and in one only one eye, but since I was only consulting physician, I can not say what the final terminations were.

The embolic nature of the process has long been shown by Virchow, and Heiberg and Litten discovered the cause of the embolism to be bacteria.

If, with the foregoing, I conclude the clinical sketch of the influence of uterine diseases on the eye, it is with the full conviction that the subject requires continued and thorough investigation. The communication of chiefly personal observations has been intentionally chosen as best adapted to furnish data for a future general description, in monograph form, of a subject so eminently practical. Occasionally, I have already referred to therapeutical questions. It may, therefore, suffice to add a few general principles of treatment.

The rational treatment of hyperæsthesia of the retina is impossible when we do not know its exact cause. The development of this condition from diseases of the genital organs, from the influence of anomalies in form and position of the uterus, from the occurrence of inflammation of these organs and their adjacent parts, and the irritation which the ovaries can produce in the eye, show that the maxim of the Salernitan school, "*qui bene distinguit, bene medebitur*," applies particularly to this group of diseases. Local treatment of the eyes will have but little effect unless we can do away with the cause of irritation. To counteract the influence of sexual irritation, bromide of potassium and lupulin are excellent means. If the ovaries are the origin of the irritation, a good remedy is atropin. sulph. 0.03 with pulv. liquir. 2.5 and an addition of succ. liquir. or extr. tarax., made into 60 pills; one pill ($\frac{1}{120}$ grain) to be taken three times daily. Tinct. gelsemini and cannabis indica are excellent adjuncts. If the hyperæsthesia is caused by shrinkage after parametritis, no therapeutics have shown themselves of avail; whereas, if it is dependent upon dysmenorrhœa from a stenosis of the orifice of the uterus, early operative interference is the rational mode of treatment. If, in the absence of inflammatory symptoms on the part of the urinogenital system and its adnexa, monthly exacerbations of eye troubles appear, the elixir proprietatis Paracelsi can not be too highly recommended. Strong individuals can take half a

teaspoonful twice daily for months; weak ones or young girls take a few drops, or one quarter teaspoonful three or four days before menstruation. Colocinth and especially sabina have similar effects. The latter has long been used by the lower classes of society to produce abortion. All of these remedies serve a good purpose in these congestions which sometimes show themselves by a flying heat at the climacterium, complicated either with disturbances of accommodation or choroidal disease. The effect of coffee must be watched, for caffëin aggravates choroidal affections. If the uterus is hyperplastic, or the vaginal portion swollen, with a tendency to hemorrhage, leeches and scarifications have a good effect on the choroidal trouble, for, according to Röhrig's investigations, the depletion of the uterine ganglia regulates the peripheric circulation and thus indirectly favors the contraction of that organ. The portio vaginalis is the most eligible place for the application of leeches. In all forms of uterine hyperplasia, distinguished by rigidity and enlargement of the portio vaginalis, the amputation of the neck of the uterus, recommended by A. Martin, has a beneficial effect on the restoration of the organ to its normal condition.

Only when the disease in the choroid and retina is no longer perpetuated by the uterine trouble is it allowable to use Heurteloup. I know only of one form of visual disturbance, in which *a priori* it does not do harm; viz., anæsthesia optica, and even here great care must be taken in reduced and anæmic persons.

Iridectomy is not justifiable when the choroidal process has led only to a few synechiæ. It must be done, however, when they have become circular, but a regulation of menstruation sometimes cures all eye troubles immediately. If, on the contrary, the tension is increased, sclerotomy under eserine cannot be too highly recommended. I have abstained from all complicated methods of performing this operation, and have simply made an incision with a lance-shaped knife, as in the first step of an iridectomy. In the disturbances of vision caused by loss of blood we may obtain good results from convex glasses and eserine.

When the loss has been excessive, iron, ergotine, dec. ratanhæ, etc., may be used. If these do not succeed, the uterus must be examined, for the trouble may have been brought about by increased vascularity and granulations in the portio vaginalis, or by endometritis hemorrhagica, or polypoid growths. Scarifications, cauterizations, injections of acetum pyrolignosum, or decoct. quercus, and, if necessary, operative treatment of the proliferations, are indicated. If the loss of blood is not only excessive but acute, retinal transudations and neuro-retinitis generally ensue. The proper uterine treatment is, of course, directed toward a cessation of the hemorrhages. The visual disturbances, stupor, and, perhaps, concomitant irritations of the roots of the pneumogastric require different treatment, consisting in such remedies as will strengthen the heart action, and in the application of warm cloths to the back of the neck. The effect of the latter is sometimes astonishing. It causes a rapid arterial flow, favors absorption of transudations, and commonly feels very grateful to the patient. If the disturbance is of a chronic character, cold compresses may be applied to the head, and covered with a double layer of dry woolen cloth, so that the subsequent heat produces a great supply of blood to the head. If in this way the transudation is diminished, subcutaneous injections of pilocarpine are to be recommended, especially when opacities in the vitreous are present.

For neuro-retinitis resulting from an acute inflammation in any part of the uterine system, ice bags to the head, besides the uterine treatment, are the best remedy. Impediments to the retinal circulation are most appropriately relieved by the application of a few leeches to the septum narium or the mastoid process, producing a direct depletion of the longitudinal or lateral sinus. To this medication may be added inunction of the neck with ol. crotonis, or ungt. tartari stibiati, and the internal use of saline remedies.

When the neuro-retinitis has subsided, the ice bags and the derivations on the neck are to be continued. A seton in the neck is to be worn in most cases, for it relieves more than any other derivative the visual disturbances resulting

from cerebro-meningeal congestion. Its effect is no less beneficial in those forms of neuro-retinitis occurring in anomalies of position of the uterus, with or without participation of the spinal cord. In all of these severer forms of disease systematic mercurial inunctions should be carried out—from 50 to 75 applications, according to the intensity of the disease, recommending the patient generous diet. So soon as the inflammation of the retina and optic nerve has disappeared, and the sight has improved, Heurteloups may be used, but rarely more than three times, and at long intervals. I have followed this method of treatment for fifteen years, and always with such results that I will never think of abandoning it.

In many of the cases the vertebræ, especially the first dorsal and the last lumbar, were sensitive on pressure. This condition was cured in most cases by blisters and irritative salves. For occasional fluxions toward the central parts, mustard plasters, rubbing of the skin with warm salt water, or else faradization was used.

If the foregoing medication has removed the active inflammation in the retina and optic nerve, we may use argent. nit. 0.15 in thirty pills, *ter in diem*, for many months, to counteract a tendency to atrophy. No other remedy will act so beneficially under conditions apparently so discouraging. Subcutaneous injections of strychnia can also be recommended, but not so much as silver nitrate. Strychnia has, however, the advantage of stimulating the nerves, especially the motor centers of the uterus, thus favoring the involution of uterine hyperplasia. Ergot has the same effect, but it must be used with caution, as it excites the pial vessels, and may, therefore, indirectly aid in the development of atrophic processes of the optic nerve.

If this paper should assist in drawing the attention of the profession to the influence of uterine disease in the production of visual disturbances, its purpose will be accomplished.

Dr. Mooren's valuable and suggestive paper, occupying 59 pages in the German edition of these ARCHIVES, had to be abridged in the English edition for want of space. The omissions mostly refer to cases cited by the author to illustrate his propositions.—EDITOR.

ON THE ANATOMICAL ALTERATIONS AFTER OPTICO-CILIARY NEUROTOMY.

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(*With plate* v.)

Translated by James A. Spalding, Portland, Me.

IT has long been known that an eye which has been subjected to optico-ciliary neurotomy regains its sensibility after an interval of some months. Prof. Hirschberg has already shown [1] that the intra-ocular portion of the ciliary nerves was normal in one case, which had twice been subjected to optico-ciliary neurotomy at another clinique than ours. Poncet [2] has further proved the regeneration of the extra-ocular portions of the ciliary nerves in a dog, two or three months after neurotomy. The same observer [3] has also described the changes which occur in the inner tunics of the eye in dogs, rabbits, and frogs, in whom neurotomy has been performed.

I propose now to describe the anatomical conditions of four eyes which had to be enucleated by Prof. Hirschberg, after optico-ciliary neurotomy had previously been performed, either at our own clinique or elsewhere. The time between the two operations varied from two months to two years.

[1] These Archives, vol. ix, p. 395.

[2] *Le Progrès Médical*, Sept. 11, 1880; compare also *C. f. A.*, 1880, p. 321.

[3] *Archives d' Ophthalmologie*, 1881, Jan'y-Feb'y.

CASE 1.—Helen H., æt. 9, was brought to us January 23, 1880, with congestive catarrh and a deep ulcer embracing the lower third of the left cornea. The ulcer soon healed under the influence of bandage, fomentations, and atropin.

February 2.—Sudden prolapse of iris in this region.

February 20.—A black convex mass is noticed beneath the extensive prolapse, and as it seems to be the lens, the prolapse is removed and an attempt made to extract the suspected lens by the narrow knife; loss of vitreous. The doubtful tissue was therefore prolapsed vitreous, the lens probably having been lost some time before. The wound healed nicely, but the eyeball began to be phthisical. Although this eye was not painful to pressure, the right eye soon showed slight pericorneal injection, but its vision was still unimpaired.

March 12.—Optico-ciliary neurotomy is performed very extensively on the left eye; recovery normal.

April 2.—The cornea and ciliary body are insensible to the touch. Still, the sensibility of these two tissues gradually reappeared, so that, as the child lived at a distance, the eye was enucleated June 24th, to prevent all danger of sympathetic inflammation.

The eye, as well as the others hereafter described, was hardened in Müller's fluid, and subsequently in alcohol. A vertical section is shown in fig. 1, plate v. *Macroscopically*, the cornea is united with the iris; the latter, with the shrivelled retina. The lens is absent, the sclera normal. The choroid is loosely attached at several points to the sclera, while at the intervening spaces it is entirely detached. The larger portion of the vitreous chamber is filled with an exudation, which, being closely adherent to the choroid, must in shrinking have started the previously mentioned detachment. A large hemorrhagic extravasation, which extends from the entrance of the optic nerve to the equator of the eye, separates the choroid from the exudation. The optic nerve appears to have undergone atrophy.

Microscopically the anterior portion of the cornea shows a few vessels which increase in number and size toward the cicatrix. Numerous round cells are also visible, while the anterior epithelial layer is thickened. Descemet's membrane bends sharply around upon the surface of the iris in the neighborhood of the cicatrix.

The cicatrix itself consists of highly vascular connective tissue,

united on one side with the pupillary border of the iris, and on the other with the tips of the ciliary processes. It then extends backward into a tissue rich in round cells and pigment, in which the capsule of the lens with a slight amount of amorphous lenticular substance is distinctly visible.

The ciliary body is dragged *en masse* toward the middle line, so that the ciliary processes appear elongated.

The iris is stretched longitudinally and attenuated above at its attachment to the ciliary body. In the middle it is bent backward at right angles. Both iris and ciliary muscle are infiltrated with round cells, so that the inner layers of the muscle are invisible to the observer.

The retina is entirely detached, totally degenerated, and lies in the anterior portion of the vitreous chamber. The various layers are with difficulty recognizable. The cavity within the retina contains several hemorrhagic extravasations, round cells, and pigment.

The vitreous is reduced to a mere transparent fibrous mass.

The exudation which occupies the vitreous chamber is amorphous, and closely united with the pigment layer of the choroid. The large extravasation reveals many perfect red corpuscles, and is separated from the pigment layer by a thin layer of exudation.

The choroid is normal, with exception of slight thickening in the pigment epithelium.

Special attention was given to the optic and ciliary nerves, which were treated with hæmatoxylin, carmine solutions of alum, carmine ammoniac (with, as well as without, preliminary treatment with palladium chloride), and Leber's method with gold.[1]

The arrangement of the optic nerve into separate bundles can no longer be accurately recognized. The septa are filled with a very fine net-work, rich in round, oval, and nuclear structures. Axis-cylinders can barely be discovered in the net-work, even with an intense carmine tinge. Longitudinal sections show the same structures in the mesh work.

The lamina cribrosa is very distinct. The nerve extends forward like a thread into the crumpled retina. No trace can be discovered of any reunion of the nerve where it had been severed during the first operation. Still, it was cut off very close to the eyeball, and during enucleation it may have been divided at about the same place as at the neurotomy. Gold preparations exhibited

[1] *Graefe's Archiv*, Bd. xiv, Abth. 2, p. 167.

a pale bluish-red color, while in the normal optic nerve, similarly treated, the nerve bundles were of a beautiful violet tint, and distinctly different in color from the interstitial connective tissue.

I next tried to dissect the ciliary nerves at the inner surface of the sclera, and succeeded in discovering two small stems near the entrance of the optic nerve, and laying them bare to their passage into the sclera. Teased-out preparations showed abundant nuclei and distinct medullary sheaths; axis-cylinders absent. I then prepared a series of sections of the sclera and posterior connective tisue in order to study the number and size of the ciliary nerves at the beginning of their distribution within the eye. The sections were made parallel to the plane of the original division of the eye, either in the horizontal or vertical meridian. With such sections we may obtain transverse, oblique, or longitudinal surfaces of the ciliary nerves and study their relations just as well as if we had laid them bare. Although the entire sclera was thus examined, the most important district is near the entrance of the optic nerve, where most of the ciliary nerves lie. Sections of the nerves inside the scleral tissue lie outside of the wound caused by the neurotomy.

The number of nerves in the most richly provided sections of the normal sclera (which were of course examined for the sake of comparison) is usually five or six. Longitudinal sections seem to show even a greater number. But these are really parts of a single nerve, which passes irregularly through the sclera, so that an intervening portion is occasionally lost in examining the surface of the section. Such a condition, however, is rare. The size of the ciliary nerves within the normal sclera varies at their entrance, according to Henle,[1] from 0.2 to 0.5 *mm.* I have thus measured them and found them to vary from 0.2 to 0.35 *mm.* The smallest ones near the posterior pole measured 0.05. *mm.*

Let us now return to our case. In the first place, there are *more* ciliary nerves than in the normal eye. I saw many sections which contained eight or ten nerves, while there was not a single one without at least four. In normal preparations, on the contrary, it is by no means unusual to find *only a single nerve.* Still, this increase in our case is too slightly pronounced for us to lay great stress upon it.

In the second place, the size of the nerves varies greatly from the normal. In our case a great majority of the nerves are small.

[1] "Handbuch der Nervenlehre des Menschen," p. 404.

Hardly a single nerve measures more than 0.22 *mm.* in diameter; all the rest are decidedly smaller, even so small as 0.023 *mm.* I would remark additionally, that for these measurements I always used transverse sections.

Histologically, most of the nerves appear normal (plate v, fig. ii, *a* and *b*). Here we see within the perineurium distinct tracings of the medullary sheaths and axis-cylinders, only the ganglia are rather more numerous than natural. The largest nerves (0.22 *mm.* in diameter) also seem to be normal. After treatment with gold chloride the nerves assume a beautiful violet color, which is, however, a trifle fainter than in normal nerves. Some of the nerves (fig. ii, *c*) of a medium diameter (0.1 *mm.*) show distinct traces of medullary sheaths and numerous nuclei; but only in a portion of the sheaths—sometimes in the larger, sometimes in the smaller—do we see sharply defined axis-cylinders. The gold reaction occasionally fails to a greater or less degree in the smaller nerves, while in glycerine preparations the medullary sheaths are much more transparent than in normal nerves.

Case 2.—Marie W., æt. 10, had been injured in the left eye several years before, but was not at the time professionally treated.

Sept., 1878.—The right eye was normal, the left phthisical.

Sept. 17, 1878.—Neurotomy was performed. The cornea at once became perfectly insensible.

A few months later the artificial eye could not be worn on account of the pain which it caused. The ciliary region was sensitive to the touch, and the cornea appeared to have regained its sensibility. As the child was about to return to India, enucleation was performed for security.

Jan. 15, 1880.—The recovery was good, and the artificial eye well borne.

The eyeball (plate v, fig. iii) measures 17.5 *mm.* in its antero-posterior diameter, 20 *mm.* in its equatorial.

The lamellar structure of the cornea is lost at the centre. Cornea and iris are united, anterior chamber abolished, Descemet's membrane preserved.

The iris is incarcerated in the corneal cicatrix, and extremely attenuated toward the periphery. Behind it lies an amorphous exudation.

The ciliary body is pushed far forward; its processes are elongated. The shrivelled capsule of the lens lies in the space

formed by the iris, ciliary body, and retina. The remaining portion of this space is filled with an amorphous exudation which contains a few round and numerous pigment cells.

The retina is completely detached, lies close behind the ciliary body, and sends a prolongation backward into the vitreous chamber. Its normal structure can barely be recognized, marked as it is with extravasations and considerable brown and black pigment. Only a trace of the vitreous body can be discovered. The vitreous chamber is filled with an amorphous exudation which adheres to the irregular surface of the pigment epithelium. The marginal layer of the exudation also contains pigment cells and hemorrhagic extravasations. The hardening process has shrivelled the exudation, and thus undoubtedly separated the choroid from the sclera, which is normal.

The bundles of nerve fibres in the optic nerve are almost entirely absent; they terminate anteriorly, in a clump of round cells which lie at the locality of the normal optic papilla, posteriorly in thick-meshed vascular connective tissue, which is everywhere closely united with the inner sheath of the optic nerve. The nerve itself terminates in a club-shaped knob. This connective tissue is evidently of cicatricial origin, subsequent to the neurotomy.

Cross-sections of the nerve show small dark islands of fibrous tissue lying in the midst of a clear substance, which contains numerous nuclei of various shapes. The islets exhibit fibres which bear only a slight resemblance to those in the normal optic nerve.

The ciliary nerves are considerably increased in number; 14 to 22 in a scleral section, and no section with less than 5. Plate v, fig. iv, shows 12 nerves, and at another part of the figure a complex of very minute nerves which can only be reduced into separate stems with a high power (× 250). But no matter how small the nerve, it always shows a distinct perineurium, and is, moreover, separated from its neighbor by scleral tissue. The number of nerves in this group is about 30; in the whole section about 40. Most of them measure about 0.02 *mm;* some with four or five primitive nerve fibres measure 0.01 *mm*, while others have a diameter of 0.06 *mm*. The variations in size of the nerves in this case is from 0.025 to 0.2 *mm*. One only is 0.2 *mm*. in diameter; the average is from 0.025 to 0.08 *mm*.

Histologically, all of the nerves are normal, except that they are

somewhat richer in nuclei. Axis-cylinders and medullary sheaths are distinctly visible, and the coloring with gold-chloride well marked.

CASE 3.—A man, æt. 55, lost his left eye from an affection of the cornea incident to small-pox in 1871. In 1879 optico-ciliary neurotomy was performed at another hospital on account of violent pain. In 1881, Prof. Hirschberg enucleated the eye on account of the typical and well-marked sensitiveness of the ciliary body to the touch.

The eye (plate v, fig. 5), measures 12.5 *mm.* in its antero-posterior diameter, 16 *mm.* across.

The centre of the cornea is occupied by a cicatrix in which lies the capsule of the lens. The cornea is normal, except in increased vascularity.

The iris is full of round cells and closely applied to the cornea.

The ciliary processes are elongated, the muscular fibres almost entirely absent, and the whole substance filled with round cells.

The choroid has disappeared, with exception of the pigment epithelium and a wide-meshed connective tissue.

The retina is degenerated and filled with round cells and clumps of pigment.

The optic nerve is totally atrophic and filled with round cells.

The ciliary nerves are not more abundant than normal, but there are more small nerves than large. The largest nerve measures 0.32 *mm.*, the average measurement being 0.02–0.06 *mm.* Each large nerve seems to be accompanied by two small ones of about 0.02 *mm.* diameter, separated from the former by the perineurium. I have not previously met with this arrangement in the normal sclera, nor did I discover it in any of the other cases. Histologically, the ciliary nerves are normal.

CASE 4.—Has already been reported by Prof. Hirschberg[1] at the Tenth Surgical Congress at Berlin, so that I merely repeat the essential data. March 26, 1881, a man, æt 18, came to the clinique saying that a bit of iron had struck his right eye two days before. $S=\frac{1}{20}$.

Although a foreign body cannot be seen in the yellowish and infiltrated vitreous, there is no doubt that it lies somewhere in the eyeball.

March 27th, the foreign body weighing 3.5 *mgr.* is removed at the third attempt with the electro-magnet, after making an incision between the rectus inferior and externus.

[1] *V. Langenbeck's Archiv.*, Band xxvi, Heft 3.

March 28th, eye free from pain; chemosis, and exudation covering the iris and pupillary field.

March 30th, chemosis and exudation absent; vitreous transparent, upward; the eye distinguishes light and darkness.

April 16th, slight pericorneal injection, no chemosis, cornea clear, anterior chamber free, a few specks of exudation on the anterior capsule. The iris is slightly swollen, pupil of medium width, with a few thin synechiæ; lens transparent. The vitreous is marked by a yellowish purulent connective-tissue mass, which has advanced nearer and nearer to the lens, and looks very green by daylight. $-T_2$. The ciliary region, outward and downward, is sensitive to the touch. Spontaneous headaches, especially at night, on the side of the injury. $S=0$.

Under these circumstances sympathetic ophthalmia seemed imminent. But as the relatives would not consent to enucleation, an extensive optico-ciliary neurotomy was performed April 16th. Cornea and ciliary region insensible to the touch; absence of headache.

May 6th, cornea transparent, with exception of a few folds visible only upon focal illumination. The yellowish opacity in the vitreous appears vascular. The eye grows atrophic.

May 20th, vessels are visible in the hazy cornea, which remains free from sensitiveness till June 13. The ciliary region is now tender to pressure, and enucleation is therefore performed June 15th with the patient's consent.

The eyeball (plate v, fig. 6) measures 14 *mm.* antero-posteriorly, 18 *mm.* across. The cornea is wrinkled visibly to the naked eye. The contours of the sclera are irregular and nodular behind. The tissue behind the eyeball is thickened, contains numerous extravasations of blood, and is so closely adherent to the sclera and optic nerve that the latter is barely visible. The anterior chamber is narrow on one side. The iris is applied to the anterior capsule. The ciliary body appears to be separated from the sclera by a structure which completely embraces it, and extends further backward.

At the periphery of the eye the choroid and retina can no longer be distinguished as separate layers. The lens looks just as if a smaller plano-convex lens had been applied to its posterior surface. Behind this lies a firm yellowish mass which occupies the rest of the vitreous chamber.

Microscopically, the cornea is normal, with exception of a num-

ber of new vessels, which are more numerous toward the limbus, and then pass over to the extremely vascular conjunctiva. Many clusters of round cells are scattered loosely about, together with extravasations of blood and bits of pigment, which are evidently the remains of red corpuscles. The stumps of the muscles, as well as the retrobulbar and interstitial tissue, are infiltrated with round cells and extravasations of blood.

The parallel arrangement of the scleral fibres has disappeared. Those which can be seen are irregularly curved. The posterior portion of the sclera is most altered: the vessels are more abundant than normal; clumps of pigment and extravasations abound, together with cells both spindle-shaped and stellate, from the pigmented stroma cells of the choroid.

The iris is nearly normal.

The ciliary body is infiltrated with round cells, which have stretched apart the muscular elements. The tissue which separates the ciliary body from the sclera is essentially composed of star-shaped pigment cells. The mesh work which contains them is filled with a granular and indistinctly striated exudation in which some round cells are embedded. The tissue previously mentioned extends backward into the choroid, where it appears as the thickened stroma layer of the latter tunic.

The choroid has undergone complete transformation, and is intimately connected with the sclera. It varies in thickness from 0.2 to 0.8 *mm.* The pigmented stroma cells are most extensively altered, and are so close together that their contours are indistinct and transformed into a fine net-work, with traces of hemorrhagic extravasation. Sometimes the meshes are coarser and crowded with round cells. The chorio-capillaris is also full of pigment cells. It contains a large number of vessels with thin walls, extravasations of blood and clumps of round cells. The other portions of the choroid are unaltered except in conformation.

The retina is partly detached from the pigment layer of the choroid. It has lost its normal appearance, the two granular layers alone being recognizable. Müller's supporting-fibres have undergone transformation into long thin fibres. The whole tunic is crowded with blood coagula, small flakes of pigment, and migratory pigment cells. A neoplastic connective tissue lies next to the retina in front, fills in the whole space between the latter and the lens, and extends uninterruptedly into the cicatrix caused by the magnet operation.

The cicatrix first appears in horizontal sections, which have struck the lens at its lower third. It is about 1.5 *mm.* wide, traverses the tunics of the eyeball, and extends like a ribband into the tissue lying between the posterior capsule and retina. The sclera is drawn toward the cicatrix, which is composed of fibrous connective tissue, rich in nuclei and vessels. In the episcleral tissue, the cicatrix is slightly marked. The choroid lies outside the cicatrix, while the retina is adherent to it. The cicatrix extends into the tissue which occupies the vitreous chamber, and is evidently the degenerated vitreous humor. The lens is nearly normal, with exception of slight pigment upon the anterior capsule.

The optic nerve in the anterior layers of the retina looks like a dark thread, with longitudinal rows of round cells. Further forward it resembles a narrow band. Posteriorly it terminates just behind the middle of the sclera, near some hemorrhagic extravasations which rest upon the scleral and retro-bulbar tissues. Still further backward we come upon a portion of the nerve which was separated from the eyeball by the operation. The bundles of nerve fibres in this portion of the optic nerve are quite distinct, although pale on longitudinal sections, while on cross-sections the axis-cylinders and medullary sheaths can hardly be recognized.

The ciliary nerves were examined, not only in scleral sections, but in the retro-bulbar tissue. Their average number in each scleral section is normal. In the retro-bulbar tissue, lying wholly behind the cicatrix caused by the neurotomy, they average five or six of normal size (0.18 to 0.38 *mm.*), and are otherwise *perfectly normal.* Those in the sclera vary in size from 0.1 to 0.17 *mm.* About one half of them are normal. The others (fig. 7) exhibit a fine net-work which differs essentially from the normal medullary sheaths. Their axis-cylinders are almost entirely absent. These nerves were evidently originally present in the sclera, and underwent atrophy after the neurotomy.

It is quite difficult in each of these four cases to tell which alterations are to be referred to the original pathological process, and which to the neurotomy. It is plain, however, that the atrophy of the optic nerve must have begun before the operation was performed.

The condition of the ciliary nerves is of most importance, and I am confident that the alterations which they display are the direct result of the neurotomy. The only objection

which can be raised is that in the case of severe injuries of the eye which caused marked alteration in its tunics, and finally phthisis of the eyeball, the ciliary nerves may be found in precisely the same condition as in the cases now under discussion.

In order to answer this objection I have examined the sclera of an eye, which I have already described in these ARCHIVES (vol. xi, p. 173, etc.). Inasmuch as a severe injury in this case caused extensive thickening of the choroid (*2 mm.*), I have the right to assume that if the ciliary nerves had undergone proliferation even after a traumatism, they would have exhibited their share in the inflammatory process by distinctly pronounced interstitial inflammation. But it happened that the number and size of the ciliary nerves were here normal. It is plain, then, so far as this case can prove it, that the neurotomy alone induced the alterations in the ciliary nerves which we see in the series of cases now under observation.

In order to decide the question of regeneration of the ciliary nerves after neurotomy, we must glance briefly at the results which have been experimentally obtained.

Almost all late observers agree that the peripheral stump undergoes degeneration after neurotomy. Schiff[1] and Bruch,[2] however, assert that the nerves may occasionally reunite by first intention without preliminary degeneration, and Glück[3] has lately observed direct reunion of the severed ends of the nerve after the careful application of a catgut ligature. Such a possibility, however, cannot be considered in our case. For even if the eyeball were rotated to its original position after neurotomy, it can scarcely be believed that the same central and peripheral nerve stumps would rest precisely against one another, and the idea becomes impossible when we purposely, as in the three cases of Prof. Hirschberg, cause the eye to deviate from its normal position by advancing the tendons of the external or internal recti.

[1] *Archiv für gemeinsch. Arbeiten*, Band ii, p. 411.

[2] *Zeits. f. wiss. Zoölogie*, Band vi, p. 135.

[3] "Experimentelles zur Frage der Nervennaht und Nervenregeneration." *Virchow's Archiv*, Band lxxii, p. 624.

In considering the regeneration of nerves Neumann[1] is of the opinion that endogenous formation of daughter-fibres within the old and degenerated nerve fibres takes place in the peripheral as well as in the short central stump which had, like the other, first undergone degeneration. He thinks, moreover, that these neoplastic fibres grow out toward one another from both sides, and traverse the granulation tissue which unites the stumps of the nerves, in which process the tissue itself plays a passive role. Eichhorst[2] dissents from this view only as far as to assume that the interval between the two ends of the nerve is bridged over by the outgrowth of *central* fibres alone. Finally, Waller and Ranvier[3] unite in the view that the fibres springing from the central stump press onward through the cicatricial tissue to the peripheral stump which they then penetrate.

The anatomical conditions in our cases can only be explained by Ranvier's theory. The new formation in the intra-ocular surfaces of the ciliary nerves starts from the central stumps which lie in the tissue behind the eyeball, and were normal in our fourth case excepting in the number of nuclei. The primitive nerve fibres of these stumps then push forward, but it is doubtful whether all of them touch their appertaining peripheral stump, since the globe has been purposely brought into a deviating position. They then simply grow into the eyeball, following those paths which offer the least resistance. Under these circumstances, therefore, they will not advance together in large numbers, as is the case with the normal ciliary nerves which are united by interstitial connective tissue, but in smaller groups. This view will explain the characteristic condition in our second case especially, in which, although there are more than the normal number of ciliary nerves in the scleral section, a majority of them are composed of comparatively few primitive nerve fibres. The latter, moreover, have not, in my opinion, entered the eyeball in the normal arrange-

[1] "Degeneration und Regeneration nach Nervendurchschneidungen." *Archiv der Heilk.*, Band ix, p. 193. "Ueber Degeneration und Regeneration zerquetschter Nerven." *Archiv f. mic. Anatomie*, Band xviii, p. 302.

[2] "Ueber Nervendegeneration und Nervenregeneration." *Virchow's Archiv*, Band lix, p. 24.

[3] "Leçons sur l' histologie du systéme nerveux," tom. ii, p. 71.

ment. The nerve fibres also may have become more numerous, as has lately been observed in the experiments of E. Neumann and others on nerve sections in rabbits. But this could not be positively demonstrated, unless we could actually compare the number of axis-cylinders in the ciliary nerves behind the eyeball with that which they exhibit in the sclera. It is of course quite possible for the neoplastic fibres of a central stump to impinge precisely upon any given peripheral stump. The regeneration would then proceed as in experiments with animals when the two stumps have previously been allowed to remain in apposition. The regenerated nerve fibres, under such conditions, push forward in the track of the old ciliary nerves, and being thus reunited to a nerve obtain a diameter equal to that of a normal ciliary nerve. This would explain the discovery in scleral sections of a few large cross-sections of nerves in addition to the abundant number of smaller ones. The latter condition might also be referred to Neumann's theory of regeneration: if the endogenous regeneration of fibres has taken place in the peripheral stump, the central and peripheral fibres could unite with one another. I am of course well aware of the boldness of this view, for we thus assume that fibres which originally appertained to different nerve tracts would here unite with one another.

We may say, generally, that the peripheral (those in the eyeball) nerve stumps undergo total atrophy.

This is shown, *e. g.*, in our fourth case, in which enucleation was performed two months after neurotomy. The number of atrophic nerves is here but little less than that of the nerves in a section of the normal sclera. Poncet, at the last International Congress in London, mentioned a case in which the nerve fibres had undergone fatty degeneration after neurotomy. The nerves which were found in the cicatricial tissue dependent upon the neurotomy showed interstitial sclerosis with inflammatory compression of the nerve fibres. Personally, I have not as yet met with analogous alterations.

The case in which atrophic nerves are present exhibits other nerves which do not differ histologically from those

which are normal, except in abundance of nuclei. The regeneration of these nerves has therefore advanced so far after two months, that we can demonstrate them in the selera. After three months and a half (our first case), no more atrophic nerves are visible; but the regenerated nerves, which are abundant, are not yet entirely normal. Their medullary sheaths in glycerine preparations are less opaque than normal, while only a few of them possess axis-cylinders. Additionally, the nuclei are still very distinct, a condition still undeniably present even after fifteen months (our second case). After two years, the regenerated nerves do not differ in any respect from those which are normal.

Explanation of Figures (*Plate V*).

Fig. 1.—Vertical section of the eye of CASE ONE; natural size. 1, Cornea. 2, Scar of marginal ulcer. 3, Detached retina. 4, Sclera. 5, 5, Choroid. 6, Amorphous exudation. 7, Extravasated blood. 8, Optic nerve. 9, Iris.

Fig. 2.—Transverse section of a ciliary nerve from the same case. 275 diameters; *a*, larger, *b*, very small normal nerve. In *a*, a portion of the nerve fibres have been cut obliquely. The drawing is but partially completed; increased nuclei; *c*, nerve with distinct medullary sheaths and numerous nerve-granules and scattered axis-cylinders.

Fig. 3.—Horizontal section of the eye in CASE TWO; natural size. 2, 2, Detached retina. 3, Amorphous exudation.

Fig. 4.—Piece from the posterior segment of the sclera in CASE TWO. 30 diameters. Numerous transverse sections of nerves of varying size. At the right, under higher powers, we see many transverse sections. The vessels and cells of the scleral tissue have been omitted for the sake of clearness.

Fig 5.—Section of the eye in CASE THREE; natural size. 1, Cornea. 2, Pigment epithelium greatly proliferated. 3, Optic nerve.

Fig. 6.—Horizontal section of the eye in CASE FOUR; natural size. 1, Cornea. 2, Sclera. 3, 3, Ciliary body. 4, Choroid and retina. 5, Lens. 6, Ciliary body degenerated into connective tissue. 7, Optic nerve.

Fig 7.—Transverse section of an atrophic ciliary nerve from CASE FOUR. 275 diameters. The nuclei and axis-cylinders have been tinted. The axis-cylinders within the fine mesh work can barely be distinguished.

CONGENITAL PARALYSIS OF THE SIXTH AND SEVENTH PAIRS OF CRANIAL NERVES IN AN ADULT.

By JULIAN J. CHISOLM, M.D., of Baltimore, Md.

Miss M. A., aged 35, has recently applied for treatment at the Presbyterian Eye and Ear Hospital. She has for some time found reading and sewing diffcult, even with glasses. Her annoyance is hyperopia, which stronger spectacles than those which she has been using will altogether correct. Her case presents other peculiarities of a very interesting nature. At the first glance my attention was immediately attracted to her curious facial appearance, and to the singular fixed stare from her eyes. This was made more conspicuous by a sinking in of the conjunctiva at the nasal side of each socket, between eyeball and nasal bone, with total absence of the caruncula. On the exposed inner side of each eyeball was seen a prominent vertical white ridge, which was located upon the sclerotic, about two and a half lines from the inner edge of the cornea. In testing the various movements of the eyes, I found the upward and downward motions perfect, but there was no lateral movement whatever, so that she could not look either to the right or to the left, even to the slightest extent, without rotating the head. She never remembers to have done otherwise.

When young she had had an excessive squint, both eyes turning in toward the nose; a deformity with which she was born. While still a child her crossed eyes had been operated upon and the deformity removed, but she does not remember being able ever to move her eyes from side to side. The external recti muscles appear never to have been innervated, and the action of the internal recti has been destroyed by the squint operation.

The case is one of congenital paralysis of the external rectus on each side, causing in early life forced convergence from want of muscular antagonism. In the operation performed for the correction of the squint, the prominent ridge now present on the inner face of each eyeball, composed of the tendinous attachment of the inner rectus, shows that a myotomy and not a tenotomy had been practised. The vertical incision had divided conjunctiva as well as muscle to such an extent, that by contraction and retraction the muscular continuity to the eyeball had been destroyed. This freed the eye from the contractile influence of the displaced muscle. This old method of operating for squint was often the means of converting the convergent into a divergent form, a very common sequel of former squint operations. In this particular case, the free section of the contracted muscle accidentally became the proper operation. When it destroyed the inner rectus as a motor oculi it permitted the eyeballs to assume a central position, which from absence of muscular influence they have retained as a permanent state since the day of operation.

The curious vacant expression of face is not altogether due to the want of lateral movement in the eyeballs. Upon inquiry I found that she had never been able to close her eyes, but in attempting to do so only rolled the balls upward under the superior lids, indicating facial paralysis of each orbicularis palpebrarum. This condition has existed as far back as she can remember. She says that she was born with it, as she was with the cast in her two eyes. The skin of the face is smooth, without a single corrugation from the brow to the mouth. Having no face movements, owing to paralysis of all the facial muscles, she is incapable of expressing any emotion whatever. Below the angles of the mouth some wrinkles can be voluntarily produced, but none in the face proper. In puckering the mouth, while attempting to whistle, the upper lip remains a smooth horizontal curtain, the lower lip being corrugated. This partial paralysis of the face muscles is an indication that some of the fibres of the facial nerve on each side of the brain have escaped degeneration and preserve their accustomed action.

This rare nerve lesion is clearly a congenital paralysis of the 6th and 7th pairs of cranial nerves, complete as to the 6th, partial as to the 7th, and symmetrical as to the two sides of the face.

When one remembers the very close relations which the 6th and 7th nerves sustain in their cerebral origin, the same accumulation of ganglionic cells in the floor of the 4th ventricle, seemingly the starting-point for nerve fibres that form each of these motor cords, the explanation is easy for the conception of a pathological lesion which might influence, even to suppression, the peripheral excitation supplied from this source. Facial paralysis and loss of power in the external rectus muscle are common forms of paralytic action, possibly among the most common of the entire muscular system. The extreme infrequency with which the loss of action in these two motor nerves is found combined, notwithstanding the fact that they have a common origin, shows how much more frequent is the peripheral cause of the paralytic affection, when contrasted with its central origin. To be sure, a very small blood clot, or a very restricted inflammatory degeneration may invade this small centre of gray matter in the floor of the 4th ventricle from which these two nerves originate, without affecting other contiguous nerve centres which abound in this contracted ventricular region. Such is, however, a very rare lesion. There is no case on record, that I am aware of, in which the pathological process has extended to the very small but very important ganglionic centre, involving the identical and exclusive spot on each side of the median line. A defect so symmetrical could only occur during the development of the cerebral mass. In the case as reported we find a condition in which while the brain and its appendages appear in every way normal and healthy a small spot of gray matter in the floor of the 4th ventricle, one on each side of the median line, has never been developed, and the 6th and 7th pairs of cranial nerves, which should receive their vital influence from this nerve centre, have, therefore, no cerebral origin.

CATARACT-EXTRACTION WITH IRIDECTOMY IN AN INFANT SIX MONTHS OLD.

By JULIAN J. CHISOLM, M.D., of Baltimore, Md.

Mrs. R's infant, a perfectly healthy child, six months old, was not attracted by bright objects as were other children. Those who saw it thought that the child was blind, and to satisfy the parents the child was brought to me to have the doubts solved. Although the pupils were well contracted, their whitish appearance indicated the character of the trouble, which a drop of atropia soon made plain. It was a double congenital cataract, with complete degeneration of the lens. It differed curiously in one respect from congenital cataract. It was gray instead of white, with sharply defined segmentation by striæ passing from centre to periphery. Each lens was similarly marked, which indicated a substance of considerable consistency. I suggested to the mother that the sooner an operation was performed for the restoration of sight the better for the child, to which she at once acquiesced. Under the anæsthetic influence of bromide of ethyl the needle operation was performed. In the right eye there was nothing unusual in the operation. In the left I noticed that the needle knife did not make much impression on the lens substance, but that the lens was readily moved from its position, the suspensory ligament having ruptured. Atropia was instilled and a wet cloth compress applied. The child did not seem in any way disturbed by the operation or by the anæsthesia. The operation did not occupy more than a minute, and the anæsthetic influence, although deep for a couple of minutes, was very evanescent. In a very short time the child was as bright as usual.

On the following day, when the bandages were removed, I found, to my surprise, that each lens was in the anterior chamber and in

its respective capsule, with pupil fully dilated, and no scleral injection whatever from the puncture of the previous day. I watched the case carefully for two days to see whether the lenses would change position, but there they remained, as if fixed against the inner face of the cornea, exhibiting conspicuously the striations and segmentations which had been previously observed. The serious character of this recent complication was fully appreciated. The patient had been brought from a distant country town ; the first child of a young and inexperienced mother, who was very solicitous that sight should be given to her first-born. I could not send the case home to await the absorption of a hard lens luxated in the anterior chamber of each eye, with the danger of irritative iritis, and to be under the care of a family physician of little experience, who seldom had a diseased eye to treat ; nor could the mother remain any length of time from her home duties. I therefore determined to extract both lenses, and at one sitting, a double operation, which I condemn as a rule, and therefore very rarely perform.

As a preparatory step I used eserine to contract each pupil and close up the aqueous chamber for the better securing of the lenses. With pupils well contracted and under the full anæsthesia of chloroform I made in the right eye the usual upper linear corneal incision, keeping well on the clear cornea to prevent, if possible, iritic protrusion, and with the expectation of getting the lens out without disturbing the iris. With the completion of the corneal section there came a gush of aqueous, and with it a large hernia of the iris, which necessitated the usual iridectomy, as in extraction of senile cataract. By making the usual curette pressure, an attempt was made to deliver the lens in its capsule, but it was firmly held by the remains of the suspensory ligament and would not advance. The capsule was then freely opened, when the lens slid out in its entirety and was delivered, as in the hard lens of old age, retaining its segmented masses in firm cohesion. The operation otherwise was a perfectly smooth extraction, in every way satisfactory. The coloboma was small and pupil perfectly clear, as there was no cortical substance to leave in the eye.

With this extraction completed the speculum was introduced into the left eye when the infant began to be restless, and more chloroform was administered. The corneal section in this eye was equally followed by an iritic hernia necessitating an iridectomy. This lens also would not yield its position to pressure,

and the cystitome was freely used to open the capsule. At this stage of the operation the patient again became restless, and a third inhalation of chloroform had to be made. When narcosis was re-established it was found that the vitreous was escaping from the corneal wound. Any attempt to deliver the lens by pressure caused very free oozing of vitreous. The capsule having been fully opened, I thought it better to leave the lens *in situ* rather than risk the introduction of a spoon or hook. Eserine was dropped in each eye; the lids were closed by elastic compresses, and cold-water dressings were continuously used.

The progress of the case was watched by me with unusual anxiety. The large amount of chloroform necessary to keep up anæsthesia, fully 2 oz., caused nausea and vomiting, which continued for 24 hours, accompanied by great restlessness and continual crying. The child had acquired the habit of rubbing its eyes with its closed hands. To avoid danger from the continuance of this habit, it was necessary to secure the hands by tying them to the child's body. This restraint added much to the many causes for restlessness which the operation has induced. The eye cloths were removed once a day for a momentary inspection of the lids and to examine for discharges. It was always followed by a fit of crying from which the infant could with great difficulty be pacified. An accompaniment to the other troubles of the infant came from the delicate health of the mother. She found that the intense excitement under which she was laboring soon broke her down and did not add to her milk secretion, which was the only food that the baby would take. Recourse was had to the soporific action of laudanum which was given to the child in one-, two-, and three-drop doses. It succeeded only partially in keeping him quiet. In the daily change of the eye dressings I dared not look into the eyes on account of the irritable disposition of the child. To keep him still when the bandages were in any way handled was quite out of the question, and, although extremely anxious to know what damage the constant crying had effected, especially in the left eye, from which the vitreous had escaped, and in which the lens remained, I had to be satisfied with inferences drawn from the momentary inspection of the face and lids and the examination of the cloths when removed once a day from the eyes.

As there had been no evidences of inflammatory reaction, I ventured on the 6th day from the extraction operation to remove

the bandages and allow the child of its own accord to open its eyes so that I might inspect them. To my delight I found the results perfect and very far beyond my expectations. In the right eye there was not a trace of injection. The brilliantly black pupil, of normal size, with iridectomy completely concealed by upper lid, contrasted conspicuously with the sharply defined white sclerotic. The white of this eye was as clear as it had been before the needle operation, and gave the appearance of a most successful cataract extraction as it is seen months after its performance. The left eye, in which the lens remained, also looked remarkably well. In this there was some little pink injection, but no evidences of adhesive inflammation of the iris. There was every prospect that in time this eye would also become good by the disappearance of the lens through absorption.

I heard from the case one month after the operation. The convalescence had been uninterrupted, no inflammation having made its appearance.

This cataract-extraction on so young a subject, although the most anxious in my experience, is also most instructive, illustrating in a very striking manner the recuperative power of infantile tissues under surgical procedures. It is one of the youngest, if not the very youngest patient upon whom the operation of cataract-extraction with iridectomy has ever been performed. The operation in the right eye was smooth, leaving a clear pupil, as the lens came out of its capsule entire, and was of such firm consistency throughout as to leave behind no particle whatever of cortical matter. The loss of vitreous in the left may be partly explained by the restlessness of the child and the very evanescent effect of the chloroform narcosis, however deep it seemed for the moment.

I have now had a very large experience in cataract-extractions, extending over twenty-five years of active surgery. In my early professional life cataract operations were few. For many years back they reach nearly 100 annually; so that I can safely say that my experience will now cover nearly if not quite 1000 cases. With very rare exceptions I administer chloroform to all my cataract patients, only omiting it when they expressly desire to have the operation

performed without artificial sleep. Such persons in my experience form the very rare exceptions; so that I administer chloroform to at least 90 out of 100 cataract patients, possibly 95 per cent. of those upon whom I operate.

I have never had cause to regret the administration of chloroform in any one single instance, but in some of the cases in which the operation of extraction was performed without its help I have wished that it had been used, as I am sure that the various steps of the operation would have been completed with much more ease to myself and safety to my patient had he been anæsthetized. My chloroform administrations will now exceed 12,000, and I have never had a serious accident from any one of these inhalations. I give it carefully and fearlessly to every patient who requires a painful operation, whether young or old, strong or weak, sick or well, with sound heart or diseased heart. In fact, I refuse it to no one who applies to me for operation. I use chloroform exclusively for all operations except the minor ones that can be perfected in a few seconds and for which I now use the bromide of ethyl, because the narcosis from it is equally deep with chloroform and much more evanescent. I administer chloroform daily, believing it to be the very best and safest of anæsthetics. With adults I invariably preface its administration with a large drink of whiskey. It is the combined influence of whiskey and chloroform that I have found so safe and satisfactory.

Vomiting is not an uncommon sequel of chloroform anæsthesia, and yet I cannot say that I have been able to trace the loss of a single eye to this cause. I am often stopped by vomiting in the midst of the operation, after the corneal wound has been made, but before the lens has been extracted; knowing that this accident might occur during cataract operations I never commence without having compresses of cotton at hand. A compress over the eye held gently with the hand till the vomiting ceases, and a new inhalation of chloroform (which by the by I push while the patient is hanging over the basin, as a means of stopping the more rapidly the emesis) enable me to complete the extraction with comfort and with safety. I have

never had loss of vitreous from vomiting that I can now recall. I attribute this to quick perception in recognizing the fact that vomiting is about to take place, when, anticipating the act, I remove the speculum and apply the handful of raw cotton over a wetted cloth. During the operation of cataract-extraction I have often seen loss of vitreous, much more frequently in former years than now, and coming on when no vomiting had taken place. This is an accident much more common with the beginner in eye surgery, and which the experienced in the handling of eye instruments seldom encounter.

I have had destructive retinal hemorrhage on but one occasion from cataract operations, three times after iridectomies for glaucoma, and that after a perfectly smooth cataract-extraction in an eye that had been partially clouded by previous attacks of inflammation in a hospital patient well advanced in years. This patient was under deep chloroform narcosis. The operation was a quick one and in every way smooth. The speculum had been removed,compresses applied and the retentive bandage put on. The adjustment of the linen cloth immediately upon the lids was not as nice as I would have liked, so I removed the compress to readjust it, when I noticed that the linen was very wet. I lifted it to find quite a pool of vitreous, with blood just beginning to show itself between the edges of the lids. In separating the lids blood was seen oozing freely from the corneal opening, with the chambers full of blood. Very fortunately for me I had told the patient that owing to the condition of the cornea it was doubtful whether the operation would give him sight. I made up my mind at once that the best course to pursue, to protect him from a painful panophthalmitis and a very tedious convalescence, was to enucleate without delay. He was still influenced by chloroform under which narcosis the removal of the eyeball was effected.

With my very little patient no trouble came from the vomiting, although it continued for 24 hours, on account of the large amount of chloroform inhaled. The constant crying, except when under the soporific effect of laudanum,

made me much more anxious. I knew that the crying of infants did not excite the degree of eye congestion, which accompanies the continued weeping of adults. But this crying was so constantly the state of my infant patient that I feared the worst results from it. Fortunately for me, and especially so for the little boy, crying did not influence the results of the operation in any serious way whatever, and the immediate sequel, after the expiration of a week, exhibited to me one of the very best results that could be obtained. This good fortune to him has now become permanent.

LONG-CONTINUED PRESENCE OF A SPICULUM OF COPPER IN THE CORNEA WITHOUT EXCITING APPARENT IRRITATION.

By WM. SHAW BOWEN, M.D., of Providence, R. I.

THE publication by Knapp (vol. xi, No. 2, ARCHIVES OF OPHTHALMOLOGY) of the innocuous lodgment of a fragment of steel in the cornea for two years, affords an excuse for the mention of the following instance of the possible toleration by the cornea of a foreign body of a more dangerous nature for nearly as long a period of time.

Mr. H., a healthy, middle-aged farmer, resident in Washington County in this State, approached the writer in December, 1881, on a railway train, with the request that he remove a troublesome cinder from the locomotive that had just lodged beneath the upper lid of the right eye. In the act of eversion an opacity was observed in the lower segment of the cornea, on a line with the pupillary margin. After brushing off the cinder a closer examination determined the presence of a foreign substance, and on inquiry concerning its history it was ascertained that it was the result of the explosion of a percussion-cap on the tube of an old-fashioned cavalry pistol in the close vicinity of the eye twenty months previously. Although the fragment was completely embedded in the corneal layers, and there was no evidence from the past history, or from an objective examination, of any irritation having been present, the probabilities of its occurrence were pointed out, and Mr. H. requested me to remove the foreign body. This was done the same day by making an incision with a narrow cataract knife along the course of the spiculum, which was lifted out with an ordinary spud. The bit of copper, which

was surrounded by gray tissue, proved bright and clear under the lens. Its length was 1 *mm.* Prior to removal, V=$\frac{14}{20}$. A slight reaction followed the removal, presumably from exposure during the homeward journey, but nothing unpleasant resulted. An examination within a few days, June 10, 1882, showed a slight corneal macula. V=$\frac{18}{20}$.

A CASE OF BLINDNESS AFTER FRACTURE OF THE BASE OF THE SKULL.

By F. P. CAPRON, M.D., of Providence, R. I.

E. H., of P., presented himself to me, at the Rhode Island Hospital, on the morning of April 20, 1882, on account of an injury to his left eye, received the evening previous. Until this time patient says he possessed excellent vision in this eye, but that the sight of the right has always been defective. His health up to the time of the injury was very good. On questioning him with reference to the cause of the injury, it was ascertained that, on the evening previous, while in a beer saloon, he became involved in some difficulty with the proprietor, who settled the matter by taking him by the throat with one hand, while with the other he seized a drinking glass, and struck him a severe blow over the left eye. With morning came the revelation to the patient that the sight of the injured eye was very much disturbed, and he immediately sought advice.

On examination the following condition was found: the lids were closed and somewhat swollen, and there was ecchymosis of the lids and surrounding parts. There was some tenderness along the upper margin of the orbit, and also over the situation of the lachrymal bone. On forcibly opening the lids there appeared a little injection of the eyeball, and some chemosis, though slight; cornea was clear, iris normal; pupil small, but reacting to light. Tension normal. On testing vision it was ascertained that the patient was able only to distinguish light from darkness, and no change was made by glasses.

After dilatation of the pupil by atropia an ophthalmoscopic examination, by the indirect method, revealed *a glistening white appearance of the inner three fourths of the optic nerve*, a condition

strikingly different from the nerve of the right eye. The vessels were little if any changed from the normal, and no hemorrhages or changes of any other kind were observed in the fundus.

The patient complained of some pain at the back of the eyeball, and stated that he occasionally blew out clots of blood from his left nostril. The case was diagnosticated as one of fracture of the wall of the optic canal, with crushing of the optic nerve. Cold compresses were kept on the eye for a few days, and the swelling of the lids and injection of the ball rapidly diminished. After a day or two a severe pain was experienced in the head, which the patient said seemed to originate behind the eyeball, and thence to extend to the opposite side of the head. During these attacks of pain the patient trembled violently, and he was left in an almost prostrate condition. Iod. potass. in moderate doses was administered, *ter die*, the patient being seen every two or three days.

His condition at present, between six and seven weeks since the injury, is as follows: lids of normal appearance; conjunctiva, cornea, and iris normal; pupil reacting to light. Optic nerve and fundus as when first seen. Field of vision very much diminished in every direction. Tn. V=$\frac{1}{\infty}$. Patient says, on directing his eye toward a bright light he sees what appears to be a "large ground-glass globe." The pain has diminished in intensity and in the frequency of its occurrence, and now comes on but twice a day, usually, instead of a number of times, as at first, and its direction is now changed, and the patient describes it in his own language as like "two branching horns" extending upward, outward, and backward. He thinks the iod. potass. helps him wonderfully, and has continued it faithfully. The hemorrhage from the nose ceased about two weeks since. There is slight tenderness over the lachrymal bone, and pain on pressing the eyeball back into the orbit. Patient's appetite continues good, but he has lost in weight from 166 to 145 lbs.

Aug. 23. Patient last seen to-day; condition unchanged, with the exception of the attacks of pain being somewhat less frequent and intense.

The right eye, which has always been considered deficient in visual power, has now so improved that with a weak convex glass V = $\frac{20}{30}$.

The above case is, in most respects, very similar to other

published cases, especially to the one reported by Dr. G. Mayerhausen, of Schweidnitz, in the February number of Hirschberg's *Centralblatt;* but it differs from some of the cases, in at least one important particular, and that is the discovery of an apparently atrophic nerve in an eye that was perfectly normal less than twenty-four hours before. This fact, and that of the subseqently unchanged condition of nerve, fundus, and vision, seem to be of sufficient interest to warrant a publication of the case.

A COMPOUND DERMOID CYST OF THE ORBIT.

By HENRY G. CORNWELL, M.D., of Columbus, O.

Miss C., æt. 33, residing in a northeastern county of this State, consulted the writer, Nov. 12, 1880. The history of the eye disease from which she was suffering I take from a note kindly furnished by her physician, who has been for some years a close observer of the case:

"At the age of sixteen a slight fulness in the upper and inner angle of the orbit was noticed, which continued to increase slowly in size, so that three years later there was a noticeable protrusion of the globe of the eye in a downward and outward direction. In 1871, six years from the time the swelling first exhibited itself, the conjunctiva of the globe and lids was often inflamed, and the overflow of the tears was quite troublesome. Nothing but domestic remedies was used. In October, 1872, went to Cleveland. Abscess of lachrymal gland diagnosed; a puncture was made beneath the lid, and this kept open about eleven weeks. In Feb., 1874, she returned to Cleveland. Part of the lachrymal gland in an atrophied condition was removed. In Sept., 1876, consulted Prof. S. D. Gross, whose diagnosis was guarded. In the spring of 1877 there was severe pain in and about the eyeball. An abscess pointed and discharged its contents through the upper lid in the region of the lachrymal gland, being aided by the use of the bistoury. This was kept discharging during the summer until August. The pus was very much like prune-juice in color, but a little thicker in consistency. The probe seemed to impinge upon denuded bone. The pus at no time was offensive. After a few weeks it changed to a yellowish cast; more often was cream-colored. From Aug., 1877, until you saw the case, there was no discharge. For some months before you saw her she had head-

ache, circumorbital pain, and pain in the globe, together with opacity of the cornea and some chemosis."

At the time the lady first consulted me the following conditions were observed :

Globe of the eye projecting from the orbit in a downward and outward direction. A large oval swelling having regular outlines and smooth surface in the upper and inner angle of the orbit. The eyeball inflamed, with slight pannus and serous chemosis. Pain in and about the eye, photophobia, lachrymation, etc. This condition was due to a want of protection of the eyeball from the air, dust, etc., by the lids, which could not be closed more completely than to cover the margins of the cornea, on account of the exophthalmus. The swelling above the globe was soft and compressible, evidently having its origin deep in the orbit. The history of its slow development, together with its appearance at this time, led me to regard it as a cyst ; and since the eyeball was inflamed, and the patient suffering from circumorbital pain and headache, and her health impaired, I advised an operation for her relief : this to be the removal of the growth, together with an effort to save the globe if possible. To this the patient gave consent, even to the removal of the eyeball, and the operation was done March 19, 1881, in Youngstown, O., with the assistance of several physicians of that city, in the following manner :

The ocular conjunctiva was detached from the inner half of the margin of the cornea, the wound enlarged with the scissors, and the surrounding tissues, by means of the handle of a scalpel, separated into the depths of the orbit. In order to facilitate these latter manipulations, a thread was passed through a part of the conjunctiva which was left attached to the globe, and the eyeball by this means drawn out of the orbit and held by an assistant. Perhaps an inch and a half from the orbital margin of the frontal bone the instrument came in contact with the wall of a cyst, which, through efforts to enlarge the opening in the orbit leading to it, was torn, and a part of its contents evacuated. The perforation was enlarged by means of a scalpel, and the remaining quantity carefully pressed out, and as much of the sac-wall as could be taken up by the forceps was afterward removed with the scissors. The material discharged from the tumor almost filled a dessert-spoon, was of a brownish-black color, of the consistence of corn-meal mush, with rather offensive odor, and made up chiefly of epithelium and fat. The orbital wound was then carefully

cleansed with warm carbolized water, and the globe permitted to return to its place, and the edges of the conjunctival wound united by means of sutures. The eyeball still turned outward, due to the lengthened condition of the internal rectus as a result of the stretching it had undergone, and to correct this divergence a tenotomy of the externus was done. This permitted the globe to assume its normal position so far within the orbit that the cornea was completely covered by the lids. The patient was directed to remain in bed, and cloths dipped in ice-water applied to the eye for twenty-four hours. On the third day after the operation evidences of orbital cellulitis were exhibited in swelling of the lids, pain around the orbit, a return of the exophthalmus now in the direction of the axis of the orbit, chemosis of the ocular conjunctiva, etc. Cold applications were made and other active antiphlogistic means were adopted, but in spite of these, three days later the cornea became cloudy at its periphery, and the inflammatory infiltration of the membrane progressed without retardation from any treatment followed, until it became entirely opaque. Panophthalmitis being inevitable, I decided to remove the globe, believing that the activity of the inflammation in the orbit would not be so great following its removal as if it were permitted to be destroyed by the inflammatory process already begun. This was done March 30th, the patient under ether. After staunching the profuse hemorrhage attending the operation, to my surprise a second sac exhibited itself, its location being above and to the upper and inner side of the severed end of the optic nerve. After an incision into what proved to be a very thick wall, about half a teaspoonful of a substance of the same character as the first sac contained was expressed after the same manner as in the first instance, and a part of the imperfectly defined cyst-wall was excised. My finger in the orbit failed to detect any thing foreign to this cavity. The cellular tissue was much denser than usual, as a result of the several attacks of inflammation which had taken place. No evidence of suppurative destruction of a part of the lachrymal gland was exhibited ; the pus discharged from a point at the upper and outer angle of the orbit when the patient was in Cleveland, evidently had its origin from the depths of the orbit in the neighborhood of the cyst. After the removal of the globe and the evacuation of the second cyst, the inflammation in the orbit immediately subsided. A week later, while examining the cavity, an oval mass, soft to the touch, was observed in the

upper and inner angle of the orbit. The patient was anæsthetized, and a small incision through the thick wall of a third sac gave exit to material of the same character as was evacuated in the two former instances. After enlarging the incision, about a third of a teaspoonful was pressed out, and a part of the sac-wall removed with forceps and scissors; this cavity was carefully syringed out with a weak solution of chloride of zinc, and in a few days the patient returned to her home. During the succeeding summer, while in Germany, I received a letter from the doctor informing me that an abscess had formed in the orbital tissues, and that the pus had burrowed a passage along the roof of the orbit, and perforated the upper lid. On examining the case a few months ago, in one or two points the cellular tissue of the orbit was observed to be indurated, but nothing of a cyst character was discovered. The lid was drawn upward, and adherent to a point on the orbital margin of the frontal bone; an opening also existed through which a small quantity of pus was at times discharged; the course of the fistula was not accurately determined for want of time, and on account of the pain attending the probing, and the patient expressed a desire to visit Columbus for a more careful examination at a later date. This has not thus far been convenient. I reasoned at this time, that the remains of the thickened cyst-wall had subsequently excited a cellulitis; the inflammation extending to the periosteum and bone, giving rise to caries, of which the discharge, and retraction and adhesion of the lid are chief indications.

Dermoid cysts are situated, as a rule, deep in the orbit. In fifty-one of the seventy-three cases collected by Berlin,[1] the situation of the sac was: in 27 (53%), on the nasal side; in 12 (24%), on the temporal side; 8 (15%), below; and 4 (7%), above. In my own case, it will be remembered the cyst was above, the largest of the three sacs toward the temporal side of the orbit.

The point of development of the sac is probably in the anterior part of the orbit, the sac projecting itself deeper into the orbital cavity (Berlin). It is located external to the ocular muscles, but, according to Mackenzie (ed. 1855, p. 326), it insinuates itself between them, and through the inflammation it excites contracts adhesions with the globe,

[1] *Graefe-Saemisch*, Bd. vi, S. 678.

the muscles, the optic nerve, periosteum, etc. He notes (*l. c.*) that they are sometimes found within the ocular capsule, but this is probably an error. They are, as a rule, unilocular, but cases exhibiting several sacs are recorded by Barnes,[1] St. Yves,[2] Szokalsky,[3] and Schiess-Gemuseus.[4] They slowly enlarge so as to, in some instances, attain enormous size.

Rosas reports a case in which the sac grew to the size of a goose-egg.[5] In Ingram's case the sac contained a wine-glassful of fluid. They have not been known to penetrate the cranial cavity. Delpech's case, recorded by Mackenzie (*l. c.*, p. 329) as a cyst projected into the brain, where, after tapping, death followed, was undoubtedly an encephalocele. They sometimes degenerate into malignant disease, according to Mackenzie, who records an illustrative case (*l. c.*, p. 327).

While solid tumors within the orbit, as a rule, whether malignant or non-malignant, after they have attained large size, cause carious destruction of its walls, this condition does not appear to apply to encysted tumors, for beyond some dilatation of the cavity nothing further has been observed. In general it may be said that such growths cause less exophthalmus than solid tumors, as they seem to accommodate themselves to the cavity which contains them. They gradually enlarge, and if left to themselves may cause death through meningitis, etc.

The direction of the exophthalmus manifestly varies with the location of the cyst. The sac-wall is in some cases very thick; in others, almost translucent. The character of the contents of these sacs varies greatly. It may be almost pure oil ("oil-cysts") as in the cases of Verneuil,[6] Hirschberg,[7] Berger,[8] Bull,[9] and others. In 37 of the 73 cases col-

[1] *Medico-Chirurgical Transactions*, vol. iv, p. 316.
[2] *Medico-Chirurgical Transactions*, vol. iv.
[3] *All. Wiener med. Zeitung*, 1860.
[4] *Arch. f. Ophth.*, xiv, 1, p. 73, 1868.
[5] *Oestr. med. Wochenschr.*, 1841-2.
[6] *Trans. Soc. de Chirurgie*, 1876, p. 1206.
[7] These ARCHIVES, viii, No. 3, p. 372.
[8] Kyste huileux de l' orbite. *Bull. de la Soc. Chir.*, No. 9.
[9] *Amer. Journ. Med. Sc.*, Jan., 1878.

lected by Berlin (*l. c.*), in 19 there were found epithelium and fat; in 9, viscid, honey-like fluid; in 6, hair [Kerst, Ammon, Lasserve, Szokalsky, Watson (2 cases)]; in 2, chalky concretions [St. Yves, Cunier]; in 1 case a tooth was discovered (Barnes, *Medico-Chirurgical Transactions*, vol. iv, p. 316).

In 45 cases the time of life at which the cysts were developed was (Berlin):

In 8 (18%), the patients were 20 years old and over.

In 37 (82%), the patients were under 20 years. Of the 37 cases:

In 16 (35%), the patients were between 10 and 12 years.

In 17 (38%), the patients were affected at birth.

Concerning the etiology of encysted orbital tumors of the variety just considered, the writer has no opinion to offer. The theory seems to be pretty well established in the minds of ophthalmologists generally, that they are formed by an invagination or involution of the external blastodermic membrane during fœtal development. Of the 73 cases collected by Berlin, all but 23 were unmistakably, judging from the character of their contents, dermoid cysts. The fact that so large a number of cases were congenital, the others developing at an early period in life—only 8 of 45 cases exhibiting such a condition after 20 years of age,—is one of much importance in favor of such a theory. Wecker differs from this opinion concerning their etiology, and regards them as retention cysts, due to an obstruction (pre-natal) of the follicles of the lid. But against this theory there is the fact, as Berlin has shown after a careful study of the literature of the cases on record, that in no case was any direct or indirect connection between the sac and lids discovered; moreover, the character of the contents of the sacs—oil and epithelium, bunches of hair, teeth, etc., *i. e.*, dermoid productions—weighs heavily in favor of the first theory. Of the 23 doubtful cases (doubtful because their contents differed from those of all the others in being thin and watery or synovia-like) according to Berlin, they can be better regarded as dermoid cysts than that they are extra-cranial encephaloceles (of which there is but one example on record), or cysts formed (according to Butterlin and others) from enlargement of the orbital bursæ.

ON THE MATURITY OF CATARACT, ITS ARTIFICIAL RIPENING, CORELYSIS, AND EXTRACTION OF THE ANTERIOR CAPSULE.

By Prof. R. FÖRSTER, M.D., University of Breslau.

Translated by J. A. Spalding, M.D., Portland, Me.

I.—*Maturity of cataract.*

IT is generally easy to tell with absolute certainty whether a cataract is perfectly mature or not. Still, there are some cases in which this point is difficult to decide, from the insufficiency of the well-known criteria for the maturity of cataract, viz., that the iris should not cast a shadow against the lens, and that the pupil, artificially dilated by atropia, should not be illuminable with the ophthalmoscope.

There are cataracts which have been mature for years, in which the iris, however, still throws a shadow, and the dilated pupil is more or less illuminable by the ophthalmoscope; while, on the contrary, there are cases of immature cataract in which the iris does not throw a shadow on the lens, nor does the dilated pupil give the slightest red reflex from the fundus of the eye when illuminated with the ophthalmoscope.

In order to avoid misunderstandings, we must first agree upon what is meant by a "mature" cataract. As v. Arlt says of mature cataract, "the lens lies in the capsule like a ripe fruit." Hence, by "ripe" or "mature" cataract we might as well agree to understand one whose whole substance *can* be evacuated by the operation, without the necessity of any portion of the peripheral layers being left behind by adhering to the capsule.

It is also, of course, quite possible for portions of the lens to remain in the eye after extraction of the cataract, even if it were mature, as, for example, happens when we cannot perfectly accomplish the last step of the operation (the cleansing of the area of the pupil), owing to too small a section and the fact that superficial layers of the nucleus are rubbed off during the exit of the lens from the eye, or when owing to the unruly behavior of the patient, or to too deep-set position of the eye, or from hemorrhage into the anterior chamber, or from loss of vitreous, etc., the last fragment of the cataract cannot be wholly removed. Even when cataracts are undoubtedly hypermature, fragments of the cortex may crumble off and be left in the eye; they may, indeed, be pushed to and fro, but their consistence prevents them from being moved along into the opening made by the incision, and they generally fall into the fold of the capsule.

Anatomical examinations would seem to prove that after every cataract extraction portions of the cortex are left behind in the capsular fold. But in all these cases the fragments of cortex float about loosely in the capsule, or outside it in the anterior chamber, and *are consequently not subjected to a subsequent process of opacification and swelling.*

On the contrary, however, in the case of *immature cataract*, and even under the most favorable circumstances, fragments of the cortex may also remain after the exit of the nucleus, either from the fact that their transparency prevents them from being seen by the operator, or from close adhesion to the capsule, so that, despite repeated rubbing of the cornea with the eyelid or spoon, they will not move from their position in the centre of the pupil, and soon become wholly opaque and swollen. When the pupil appears black after the operation, or, at most, reveals but a few thin fragments of cortex that cannot be pushed aside or removed, and then on the next or following days is blocked up by gray masses, I am convinced that this occurrence has arisen from opacification and swelling of those transparent portions of the cortex (according to Becker, from the posterior cortex) which were left in the area of the pupil. Some

operators have endeavored to explain this subsequent blocking up of the pupil by claiming that the cortical masses which were left in the capsular fold had been in some way pressed toward the axial portion of the capsular sac.

I will not, of course, deny the possibility of such a change in the position of the cortical fragments, but I think that the blocking up of the pupil is by far most frequently and simply due to secondary opacification of the transparent central portions of the cortex which remained in the eye after the operation. This view appears all the more justifiable, because an accurate examination of the cataract before the operation and observation of the behavior of those portions of the cortex which cannot be removed, permit us to predict with certainty whether the pupil will be clear in the following days, or covered with a grayish cloud.

A *mature* cataract, consequently, is one in which we can positively assert before the operation that there are no longer any cortical layers which will adhere to the capsule and undergo secondary opacification—*even if the pupil can still be illuminated and the iris still throws a shadow.* An *immature* cataract is one of a consistency which experience teaches us is liable to be accompanied with a layer of cortex adhering closely to the capsule—*even if the pupil cannot be illuminated and the iris throws no shadow.*

In this sense of the word "*maturity*," we shall include:

1. The great majority of cataracts in which there can be no doubt (for the two tests above mentioned concur in proving maturity), and in which there are no sectors which shine like mother-of-pearl. Such cataracts are white, yellow, or yellowish-gray. The whiter they are, the thicker the cortical substance.

2. Those cataracts with a very large *brownish-yellow* nucleus, which completely fills the capsular envelope, and with no cortex at all, or only a very thin layer, at least in the area of the enlarged pupil (phacoscleroma). *The pupil is generally more or less illuminable*, and *the iris throws a distinct shadow.* Even after years the nucleus never gets so dark as the cortex. Oblique light and the shadow penetrate deeply into the nucleus, which is about as transparent

as brownish or yellowish ammoniac soap, while the cortex resembles whitish soda soap. The occasional absence of the shadow and the impossibility of illuminating the pupil are simply due to the opacity of the cortical layers. But even in these pure nuclear cataracts, we can see by extreme lateral inspection and oblique illumination, that the opaque lenticular substance extends to the limit of the capsule, but the mother-of-pearl reflection upon the anterior surface is entirely absent.

Cataracts of this sort, although undoubtedly mature, allow of a considerable amount of vision; fingers can be counted at 2 *m.*, or even further. It may indeed occasionally happen, that we can still distinguish the optic papilla by means of the ophthalmoscope, and that the patient can decipher ordinary print if he holds it very close to the eye, and uses a strong convex glass. The only alteration that these cataracts undergo is that in the course of years the nucleus grows darker and darker brown. I once knew an old man who had had such mature cataracts for fifteen years, but as he could always easily find his way about alone, he would never consent to an operation.

3. Certain cataracts of very slow development, with bright yellow or whitish and relatively small nuclei, and a thick layer of semi-transparent cortex (Becker's nuclear cataract: *Graefe-Saemisch*, Band v, pag. 269). When in the course of years *a thin subcapsular layer has finally grown opaque* (as we can easily discover by focal illumination and lateral examination), the iris still shows an intense shadow into the extremely transparent cortical layer. If we make a preliminary iridectomy, and dilate the pupil with atropia, we can easily distinguish the borders of the small white nucleus in the area of the coloboma, while the cortical layer at the side of the border of the nucleus is transparent. The anterior surface is not divided off into sectors, nor does it glitter like mother-of-pearl. In this stage, these cataracts escape from the capsule without leaving any cortical fragments.[1]

[1] Of course, I do not assert that an intermediate layer of cortex remains permanently transparent in all cases of Becker's nuclear cataract.

Amongst *immature* cataracts are to be included, despite the absence of the shadow from the iris and the impossbility of illuminating the pupil, those in which the opaque cortical substance is divided off into well-marked sectors of a mother-of-pearl or tendinous glitter. Inasmuch as all the sectors do not shine alike, with equal illumination, the glitter in the different sectors varies with the alteration in the angle of incidence, so that the anterior surface of the lens appears faceted. If the division into sectors is sharply defined, or only discovered at an early stage of its development, and, moreover, if transparent portions of lenticular substance are discovered in close proximity to those opaque portions which lie close behind the capsule, we can confidently anticipate that some thin flakes of cortex will not be expelled through the incision, even if we rub the cornea with the eyelids or spoon; they will always slip back into the eye the transparent lenticular substance holding them firmly to the capsule. On the next or following days, however, the area of the pupil is almost filled with opaque lenticular substance. The anterior or posterior cortex may have been the one to adhere to the capsule, but it is worthy of notice that the posterior surface of the nucleus is generally covered with a much thinner layer of cortex than the anterior.

I have repeatedly examined eyes in which the same cataract appeared at the posterior pole of an amber yellow tinge, surrounded by a white ring (opaque cortex), while on the anterior surface it was white. The posterior surface of the nucleus evidently extended to the capsule, while in front it was covered by a thick layer of cortex. The cortical layer is always thickest at the equator of the lens, thinnest at the posterior surface.

We can declare with confidence that when the anterior surface of a cataract is divided off into sectors which shine like mother-of-pearl, the cataract is not yet mature. If we wait a few months for the operation, the sectors lose their sharp contours, break down, begin to grow invisible, and finally disappear entirely. Complete maturity in the above-mentioned sense has now ensued, and we can depend upon a favorable exit of the whole cataract. At a still later stage,

the yellow nucleus which had hitherto been remarkably well concealed, becomes somewhat more marked in color, the cortex appears thinner, as if dessicated upon the nucleus, and provided with a few whitish radiating lines—in a word, the cataract is becoming hypermature.

II.—*Artificial ripening of cataract by trituration of the cortex.*

The painful period for patients afflicted with cataracts is that which lies between the day when they can no longer read, and the time when the cataract becomes mature. This interval may extend over several years, but fortunately it is often rendered much more endurable by the circumstance that the two eyes are not generally affected in an equal degree at the same time. But when a cataract makes the head of the family incapable of work for year after year, the occurrence becomes a family affliction. The patient thinks that he ought to be operated upon the moment that the cataract incapacitates him for work, whilst the surgeon feels obliged to wait till the favorable moment, the maturity of the cataract, has at last arrived. Desirous as the surgeon is to do every thing that is compatible with safety, he is often inclined, in such cases, to seek experimentally for some operation which may hasten the cataract toward complete maturity.

It is well known that puncture (incision) of the anterior capsule has long been resorted to, to produce rapid artificial maturity in cataracts. But the method has not been universally adopted, from the dread that it might set up iritis from excessive swelling of the cataract, and lead to complications unfavorable for the subsequent extraction. Personally, I have never seen iritis or cyclitis after puncture of the capsule in cases of *senile* cataract, while on the contrary I have often been greatly surprised at the comparatively slight and rather unsatisfactory effect of the capsular incision in hastening the opacification of a lens with a large nucleus more or less advanced in cataractous degeneration. We can make an incision 3 or 4 *mm.* long in the capsule of such cataracts without causing extensive opacity of the

cortex. The only effect is the presence, a few days later, of a small flake of cortex pressing forward into the anterior chamber, while a really hard nucleus does not seem to undergo any swelling at all or resorption from contact with the aqueous humor. I have seen many and many a nucleus lying in the anterior chamber of eyes in which the operation of reclination had been performed fifteen or twenty years before. These nuclei had subsequently slid forward from the vitreous body into the anterior chamber, measured 4–5 *mm.* in diameter, and lay there month after month without undergoing any visible alteration. Many similar instances of nuclei lying for years in the vitreous chamber also, without undergoing resorption, are recorded in *Graefe-Saemisch* (Band v, pag. 329).

For five years I have resorted to a process (well worthy of recommendation in suitable cases) in order to hasten the maturity of slowly ripening cataracts, especially Becker's nuclear cataracts (see, *antea*, page 347). It likewise happened to me, as it did to Snellen (*Graefe-Saemisch*, Band v, Pag. 361), to observe that an iridectomy occasionally hastens the maturity of cataracts.

Case.—Mr. H., æt. 45.

January, 1873.—Has incipient cataract in his left eye; a further advanced cataract in his right eye. The left eye only is still capable of work.

Sept., 1874.—This eye has lost its useful vision.

Both lenses have yellowish-white nuclei, while the cortex is only partially opaque, and several years will undoubtedly pass ere the cataracts reach maturity. The patient was urgent for an operation, to prevent his being put on the retired list. I intended to make an incision in the capsule, but as the cortical layer was very thick I dreaded the advent of excessive swelling of the lens after making the incision, and contented myself with performing an iridectomy in each eye.

Oct. 1, 1874.—To my surprise both lenses became so opaque directly after the operation that the incision in the capsule was postponed, and in the short period of five weeks after the iridectomy the cataract in the right eye was extracted as mature. The cataract in the left eye also had already undergone complete

opacification during this short period, but the sectors upon the anterior surface were still sharply defined. Five months later the sectors had disappeared, and extraction was performed. Both operations were normal, the cortex came entirely away, and the recovery left nothing to be desired.

We may assume under such circumstances that, owing to the alteration in form to which the lens is subjected by being pushed forward after the escape of the aqueous humor, the connection between the opaque and transparent fibres of the cataract is loosened, and the degeneration of the cortical layers hastened. We may undoubtedly further this condition of things directly after the iridectomy by *gently* rubbing or stroking the cornea with the blunt angle of a strabismus hook or the closed iris forceps. It is astonishing to see the effect which is produced upon the lenticular substance by pressing gently upon a cornea which has thus been temporarily deprived of its normal tension. If mother-of-pearl sectors were already present on the anterior surface of the lens, we immediately notice how they break up and intermingle with one another after this manipulation. But even if the sectors had not previously made their appearance, the crushing effect upon the cortex, as thus produced, is easily recognizable by the increased opacification which takes place in the layers which were still transparent, even within the space of only a few days. I have known cataracts that were illuminable before the operation, to become so opaque six days later, as entirely to cut off the red reflex from the fundus of the eye. The shadow of the iris generally disappears, but not wholly; the white nucleus of Becker's nuclear cataract becomes almost wholly concealed by the opacified cortex. In the same way the senile, yellowish-gray nucleus which had hitherto been visible through the transparent layer of cortex disappears beneath the advancing opacification of the peripheral layers of the lens. Extraction can generally be undertaken in from four to eight weeks after the operation, without the dread of any lenticular fibres adhering to the capsule. It is very rare for us to be obliged to postpone the extraction to a later date.

The only difficulty in this manipulation lies perhaps in an accurate calculation of the pressure to be applied. If the pressure is excessive, the zonula may easily be ruptured, and when we subsequently perform the extraction, unavoidable loss of vitreous and difficult delivery of the lens itself would ensue. I should not think that there was any danger of rupturing the capsule. If, on the contrary, too gentle a pressure is brought to bear, the connection between the lenticular fibres will be too slightly disturbed, and speedy maturity will not occur. But these difficulties are really only imaginary. Whoever can extract a cataract must possess the necessary degree of touch. We must, however, not be so sanguine as to expect that every cataract, no matter how far developed, can be brought rapidily to maturity by kneading the cornea. So-called choroidal cataracts, *e. g.*, in which only a thin cortical layer at the posterior pole is alone opaque, whilst the larger part of the lens remains transparent for a very long period, cannot generally be altered by this procedure. Experience, based upon two hundred and more cases, teaches me that the expected maturity can be most surely awaited in those cases of cataract with a firm and somewhat opaque nucleus, for the cortical substance will then be, as it were, crushed to pieces between the cornea on the one side and the hard nucleus on the other. A further condition of a safe and rapid result is that opacification in the anterior cortex, even if very peripheral, and consequently decay of the cortical fibres, must already have set in. Healthy lenses are not generally rendered opaque by moderate pressure or rubbing upon the cornea (compare Case 3, *postea* page 353).

A few examples may here follow:

Case 1.—Madame K., æt. 51.

Jan., 1872.—The left eye has small whitish opaque nuclei. Sn No. 8 is scarcely read with + 12. Sight has been gradually diminishing for eight years.

Oct., 1877.—Five and a half years later, left eye, small whitish nucleus surrounded by a thick layer of extremely transparent cortex.

Oct. 15, 1877.—Iridectomy upward, followed by trituration of

the cortex. Seven days later the whitish nucleus can no longer be distinguished; the zone of transparent cortical substance which appeared dark has given way to a whitish opacity.

Jan. 25, 1878.—Peripheral extraction.

Feb. 15*th.*—Aphakia, pupillary border free, media transparent, optic papilla very distinct.

Case 2.—Mr. P., æt. 65.

Sept., 1874.—Left eye blind for several years from detachment of the retina; right eye: clumps of floating opacities in the vitreous, grayish-green opacity of nucleus, traces of opacification in the cortex, atrophy of choroid (sclerectasia posterior). Sn No. 3 is decipherable with difficulty. The patient cannot read at all.

March, 1877.—The pupil, when dilated with atropia, gives a red reflex; the optic papilla is still visible, as well as the vitreous opacities. Sn No. 5 with difficulty.

Sept., 1877.—Condition about the same; nucleus dark brown; no cortical opacity.

Sept., 18, 1877.—Iridectomy with trituration of the cortex; ten days later the pupil is no longer illuminable. Jaeger No. 24 can no longer be made out. A white opaque layer of cortex covers the nucleus.

Nov. 6, 1877.—Extraction, with total escape of the lens, and good recovery.

Case 3.—Mr. F., æt. 67.

May, 1876.—Incipient cataract in both eyes. *Left*, Sn. No. 3 at 4″ barely (sclerectasia posterior). *Right* eye still useful.

April 11, 1877.—Left eye: optic papilla recognizable; nucleus moderately opaque; reflex from the posterior capsule still recognizable, but distorted, and surrounded by a vapor halo. The cortex begins to opacify and divide into sectors. The right eye is already useless.

April 18*th.*—Iridectomy on the left eye, with trituration of the cortex.

April 26*th.*—Decided increase in opacity. The dilated pupil cannot be illuminated. The anterior cortex is white and glitters like mother-of-pearl.

July 3*d.*—The anterior surface of the lens still shows the sectors, but extraction is performed despite this condition.

July 20*th.*—Recovery good; no posterior synechiæ; a few flakes of cortex in the area of the pupil, but the optic papilla is recognizable. Sn No. 3, with + 2¾ at 5″ to 8″.

III.—*Corelysis, and the avoidance of anterior synechiæ.*

Pressure on the flaccid cornea has an equally influential action upon the iris also. After the aqueous humor has flown off, every portion of the pupillary margin can be dislocated far out toward the periphery of the anterior chamber by pressure exerted upon the cornea in various meridianal directions. The moment that the instrument is removed from the cornea, the portion of the pupillary margin that has thus been treated returns toward the axis of vision. By successively pressing one portion of the margin of the pupil after another toward its ciliary insertion, we can also successfully break up posterior synechiæ. Narrow, thread-like adhesions can, undoubtedly, be ruptured in this manner, even if very numerous. If the adhesions are broad and ribband-shaped, the process is not generally so successful.

As it is always extremely desirable to free the whole pupillary margin, when we perform an iridectomy in cases of numerous synechiæ, I would suggest that the iridectomy should always be supplemented by this manipulation. In this way I have often succeeded in freeing the whole pupillary margin, even when completely adherent to the lens. Of course we must use atropia energetically, both before and after the operation.

I have never known this procedure to do any harm to the iris or lens, still it should be limited to cases in which all inflammatory reaction upon the part of the iris has disappeared.

We may resort to a similar manipulation also—gentle stroking pressure with a blunt instrument upon the cornea,—in order to avoid an incarceration of the iris in the angles of the incision, which might become permanent after an iridectomy. It is also available in warding off anterior synechiæ.

Although we may acknowledge that it is, in a few cases, impossible to avoid imprisonment of the iris in the angles of the incision—especially in the case of an atrophic and friable iris, loss of vitreous, or extensive hemorrhage into

the anterior chamber by means of which our view of the parts is impeded,—yet in a general way it may be asserted that adhesions of the iris in the cicatrix indicate bad surgery. Still more decidedly can this be said of a subconjunctival prolapse of iris, as is occasionally observed after cataract-extraction by the peripheral linear incision. In order to repair these accidents, we are generally advised to push back into the anterior chamber, with a spatula or probe, the bit of iris which lies in the angle of the incision, or to seize it with the forceps, draw it further out, and cut it off. Both of these procedures deserve, of course, to be carefully considered, and I am far from desiring to reject them. The latter especially is often greatly to be preferred when a large nucleus has in its exit pushed a considerable fold of the iris into an angle of the incision, because it is much better to remove a part of the iris that has undergone excessive pressure than to replace it. By this procedure we of course obtain an extremely large artificial pupil.

In the majority of such cases, however, a few strokes with gentle pressure upon the cornea by means of the knee of the closed iris forceps or with a spoon is almost always sufficient to cause the margin of the pupil to return to its proper position in the eye. This step can be accomplished by placing the knee of the forceps on the angle of the incision in which the iris has been incarcerated, and with gentle pressure slowly passing down across the cornea (if the incision were made in the upper margin of the cornea), in the direction of the middle part of the lower edge of the cornea. By this manœuvre we drag, as it were, the iris back again into the anterior chamber. We must repeat the process until the corners of the sphincter appear in their correct position. The procedure is more efficacious, and probably irritates the incision less than the reposition of the prolapse with the spatula.

IV.—*Removal of the anterior capsule in cataract-extractions.*

The presence of fragments of the lens in the eye after extraction of cataract has always been regarded as the chief

cause of secondary inflammation. And this is the reason why so many attempts have been made to extract cataracts with the closed capsule (*Graefe-Saemisch*, Band v, pag. 284). Since Pagenstecher and Becker have drawn attention to the fact that the incarceration of tags of capsule in the incision may give rise to inflammation of long duration in the ciliary body, a new demand has arisen for the removal of the capsule also, at the time of the operation. But it is not so much the capsule as a whole, as the fragments of the *anterior* capsule which are to be accused as the noxious cause, for there can be no dread of the incarceration of the posterior capsule in the incision after a normal performance of the operation.

Opacities of the capsule ought to be removed from the eye *before* the escape of the cataract. This can generally be accomplished easily with the forceps. But in so doing we of course seize upon a much larger piece of capsule than that which is opaque, and withdraw it from the eye. Experience of this sort induced me eight years ago in a series of cases to make an experimental opening in transparent capsules also, with toothed forceps, rather than with the cystotome. I soon found the method so advantageous that I resorted to it regularly, and only returned to the cystotome when the forceps left me in the lurch. v. Arlt has also employed this method in a few cases (*Graefe-Saemisch*, iii, 300), and Colsmann, who has had peculiar saw-tooth forceps especially constructed for this purpose, has published a case [1] in which with this instrument he cut a piece 3 *mm.* broad and 5 *mm.* long from the anterior capsule.

As neither of these authors, however, have reported any more cases in their own experience, and as, on the contrary, I have tried a similar method in some hundreds of cases since October, 1874, I think that I may be permitted to speak of the subject somewhat more in detail.

In opening the capsule, I formerly employed Liebreich's iris forceps, with two teeth on the under side of each arm close to the point, but within the last six months I have

[1] Colsmann: Ueber die Entfernung eines zusammenhängenden Stückes aus der vorderen Linsenkapsel. Wiesbaden, 1879.

used a forceps with three teeth on each branch, and find it much more serviceable than Liebreich's.[1]

Energetic instillation of atropia precedes the operation for a whole day. The forceps are introduced closed, pushed beyond the centre of the pupil, and then opened as wide as the edges of the pupil will allow, even crowding them somewhat aside. They are then closed, with very gentle pressure of the arms against the anterior capsule. As we complete the closure, we can often see that we have caught up a fold of the capsule which lies enclosed between the teeth of the forceps. On withdrawing the forceps, however, we find a larger bit of capsule than that which corresponded precisely to the space lying between the teeth. It is a very nice plan to drop the bit of capsule into Müller's solution, then to tint it, and finally to spread it out smoothly upon a glass plate. We then see to our surprise that the diameter of the lowermost round or oval bit of capsule measures as much as 6–7 *mm.*, and as the whole capsule measures only 9 *mm.*, we have evidently in such cases removed the greater part of the capsule, so that only a narrow rim remains. It may well be supposed that in this way fragments of the capsule will not so frequently become incarcerated in the incision.

The fact that the bit of capsule thus removed is almost always larger than that which lies between the teeth of the forceps, certainly indicates that toward the equator of the lens the capsule offers less resistance—tears more easily—than in the neighborhood of the anterior pole, a condition which can be explained by the capsule being *twice* as thick at the anterior pole as at the equator. According to Ritter,[2] the capsule is 0.007 *mm.* thick at the equator, and 0.016 *mm.* at the anterior pole.[3]

[1] These forceps can be had at Brade, instrument-maker's in Breslau, Hummerei, 31, at the price of 4 marks.

[2] Wecker: "Maladies des yeux," Paris, 1868, tom. ii, page 3: "At a short distance from the equator of the lens and a little to this side of the origin of the zonula, the capsule increases quite sensibly in thickness," etc. The figures 0.16 *mm.* are a printer's error, and should be 0.016 *mm.*

[3] The slight thickness of the periphery of the anterior capsule also explains another disagreeable accident which sometimes occurs in splitting secondary cataracts. When we have in view to divide with a needle a secondary cataract that is somewhat thicker than usual, it often happens that the cataract does not

Another great advantage of removing the larger part of the anterior capsule lies in the fact that the cortex escapes more perfectly and completely, since none of it can be left behind by adhering to the anterior capsule. I would here remark, by way of parenthesis, that some lenticular substance is always discovered clinging to the capsule, when the latter has been removed in the way suggested above.

I have succeeded in seizing a fold of the capsule with these forceps, in 88 out of 100 cases. In 85 simply a piece of the capsule was thus removed; in three, the whole lens with its capsule followed the traction. In twelve further cases the forceps slipped, as most frequently happens, in my opinion, from an abundance of cortex or a greatly swollen condition of the lens. Perhaps this large percentage of cases in which the forceps slipped might be reduced, by taking care that the teeth of the forceps were very sharp. If we cannot rupture the capsule by grasping it once or twice, I would advise the use of the cystotome, rather than to exert too great force with the forceps. I have not had any greater percentage of loss of vitreous by this method than when I simply used the cystotome.

The best method of clearing away the capsule after exit of the lens, is to push the fine, straight, toothed forceps between the lips of the incision, and by repeatedly opening and closing them to endeavor, in the whole length of the incision, to catch the fragments of the capsule. We can thus frequently grasp them, especially when the capsule has been opened with the cystotome. I then make gentle traction, helping myself, if occasion demands, with a second pair of forceps. I think that it is not only unnecessary but even injurious to cut off these capsular fragments as has been recommended by some operators, for the fragments are then much more liable to become incarcarated in the incision. I have no fear of prolapse of vitreous during this

tear at the spot, or solely at the spot which has been directly attacked with the needle, but at a district in the capsule which lies further behind the iris, and consequently toward the periphery of the capsule. Our aim, therefore, of making a strictly central opening in the capsule partially miscarries. I have consequently abandoned the use of the cataract needle for years in all operations on simple secondary cataracts, and used v. Graefe's cataract knife, with which we can make a more extensive drawing incision than with a needle, the blade of which is too short for this purpose, and tears a hole rather than cuts one.

manipulation, for I have previously withdrawn the elevator and removed the fixation forceps.

Although the statistics to illustrate the advantages of this method by the percentage of recoveries will gain greater significance by future accumulation of cases, and after a longer series of years, yet I feel as if I ought to cite this fact, that in a successive series of 100 cases of uncomplicated senile cataract, operated by the above-mentioned plan, I have obtained a perfect recovery in 89, with a perfectly free pupil—without a single posterior synechia.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE FIRST QUARTER OF THE YEAR 1882.

By H. MAGNUS, Breslau; C. HORSTMANN, Berlin; and A. NIEDEN, Bochum.

WITH THE COÖPERATION OF

E. Nettleship, London; C. E. Fitzgerald, Dublin; E. Marckwort and P. von Mittelstädt, Antwerp; Dantone, Rome; van der Laan, Lisbon; Hirschmann, Charkow; S. M. Burnett, Washington; Ole Bull and Schiötz, Christiania.

Translated by Dr. F. E. D'Oench, New York.

A.—GENERAL OPHTHALMOLOGICAL LITERATURE; GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS; NORMAL ANATOMY AND PHYSIOLOGY.

By H. MAGNUS, M.D.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

a.—TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL, BIBLIOGRAPHICAL, AND HISTORICAL SUBJECTS.

1. Atti dell' associazione ottalmologica italiana. Sessione di Roma, 26–30 Sett., 1881. *Ann. d' ottalm.*, vol. x, 6. The society, though founded in July, 1869, began to flourish only lately; it now has 40 members, and meets annually in September in an Italian university-city; Padua was chosen this year, and Prof. Gradenigo, president.

2. Dreher. The effects of light. *Studenten-Zeitung*, 1882, Nos. 9 and 10. The vibrations of the ether cannot produce the conceptions of heat and light by at one time striking the skin and at another the eye; the line between rays of heat and light must be strictly drawn. In the solar spectrum there are three kinds of rays: rays of light, heat, and chemical rays, to which as a fourth kind the magnetic rays might be added. The light of fluorescent substances is

not due to the light illuminating them, but is a transmutation of the chemical rays contained in the light into rays of light.

3. EVERSBUSCH. The most important contributions to the comparative anatomy of the eye. *Zeitschr. f. vergl. Augenheilk.*, 1882, vol. i.

4. GIRARD. Les cécités soudaines. *Rev. d' ocul. du sud-ouest*, vol. iii.

5. GUAITA. La microfotografia applicata all' anatomia patologica. *Ann. d' ottalm.*, vol. x, 6. A Hartnack microscope is provided with a camera obscura, into one end of which a prepared plate can be inserted. In order to obtain pictures of moderate size, either the ordinary lens of the photographic apparatus, or one of the object-glasses of the microscope is used; to obtain still larger pictures the eye-pieces of the microscope are also added. The samples of sections in retinitis pigmentosa are very good. DANTONE.

6. MENGIN. Observations cliniques. *Rec. d' ophth.*, 1882, No. 1. 1. Injury of the eye. 2. Foreign body in the eye. 3. Compound myopic astigmatism with monocular diplopia.

7. STELLWAG VON CARION. Papers on practical ophthalmology; supplement to the text-book; in conjunction with Prof. Wedl and Dr. Hampel, Vienna, 1882. 1. Some terms used in ophthalmology and their clinical meaning. 2. The pathological anatomy of glaucoma, by Prof. Wedl. 3. Increased tension and glaucoma. 4. Embolism of the central retinal artery. 5. Central power of vision. 6. The power of accommodation and its influence on the choice of glasses. 7. The connection between the power of accommodation and strabismus. 8. The diagnosis of paralysis of the muscles of the eye.

8. STREATFEILD. Observations on some congenital diseases of the eye. *Lancet*, 1882, Feb. 18 and 25, No. 3052.

b.—STATISTICAL PAPERS.

9. ALEXANDER. Third report of the ophthalmic institute of the district of Aachen. Aachen, 1882. New patients 2009; 299 operations: 11 extractions of senile cataract, 31 iridectomies, 11 operations on the muscles—3 of detachment of the retina.

10. WHITE. First annual report of the Richmond Eye, Ear, and Throat Hospital, for 1881. 418 eye-patients; 116 operations: among them 23 extractions, 16 iridectomies, 8 enucleations, 9 tenotomies. BURNETT.

11. Fifty-sixth annual report of the Massachusetts Charitable Eye and Ear Infirmary, for the year 1881. Boston, 1882. With an illustration and plan of the institution; 7471 eye-patients; 815 operations: 102 operations on the lens—among them 72 extractions of senile cataract after Graefe, 13 by suction—20 iridectomies, 42 enucleations, 90 operations on the muscles. The 72 extractions are reported by Derby in a careful statistical paper: in 85 per cent. a good result was obtained; 2.7 per cent. were total failures.

12. GÜTERBOCK. The sanitary condition of the engineers of the Berlin and Anhalt R. R. *Deutsche Vierteljahrsschrift für öffentl. Gesundheitspflege*, 1882, vol. iv, 1. Among 180 persons 10, =5.5 per cent., had V < 1; one had a senile cataract; 1, conjunctivitis; 1, detachment of the retina; 1, maculæ corneæ.

13. JANY. Seventeenth annual report of Dr. Jany's ophthalmic institute at

Breslau, 1881. Breslau, 1882. 3562 patients; 118 operations on the lens: among them 50 extractions for senile cataract with perfect result in 94 per cent., imperfect result in 4 per cent., and total loss in 2 per cent.; 72 iridectomies, among them 9 for glaucoma; 8 sclerotomies in glaucoma, 20 enucleations, 17 squint-operations.

14. Thirtieth annual report of the Silesian Society for the relief of poor eye-patients, for the year 1881. Very brief report. 3817 patients; 72 extractions of senile cataract; 48 iridectomies, among them 26 for glaucoma; 22 squint-operations.

15. KERSHBAUMER. Fourth report of the Salzburg Ophthalmic Institute, for the year 1881, and a third, fourth, and fifth hundred of cataract-operations. Salzburg, 1882. 2056 new patients; 89 extractions according to Graefe: in 87 cases perfect result, 1 imperfect result, 1 failure; 77 iridectomies; 30 of them for glaucoma; 1 sclerotomy; 25 operations on the muscles. The report of the cataract-operations will appear later.

16. Newark Charitable Eye and Ear Infirmary. Second annual report, for 1881. Newark, 1882. Statistics missing.

17. PFLÜGER. Ophthalmic clinic of the University of Berne. Report for the year 1880. Berne, 1882. 1640 eyes were treated; the number of patients is not given. 189 more important operations: 12 extractions according to Graefe, 11 successful, 1 failure; 54 iridectomies, 16 of them for glaucoma; 15 operations on the muscles.

18. REYNOLDS. Cataract-extraction. *Med. Herald*, 1882, Feb. Report on 222 extractions, with a loss of 4 eyes. Broad sclero-corneal section, extensive iridectomy and peripheric capsulotomy. BURNETT.

19. SCHÖLER. Annual report of the ophthalmic clinic for the year 1881. Berlin, 1882. 4326 new patients, 339 operations, 52 extractions according to Graefe: among them 17 with V=1–$\frac{2}{3}$; 10 with V=$\frac{1}{2}$; 5 with V=$\frac{1}{3}$; 8 with V=$\frac{1}{4}$; 6 with V=$\frac{1}{5}$; 1 with V=$\frac{1}{6}$; 1 with V=$\frac{1}{11}$; 1 with V=$\frac{2}{10}$; 3 with V=$\frac{1}{20}$. 66 iridectomies, of these 18 for glaucoma; 9 enucleations, 8 optico-ciliary neurotomies, 96 operations on the muscles.

20. SOKOWITSCH. Ophthalmological note. *Militarmed. Journ.*, Feb. 1882. The following visual results were obtained at an examination of the 14th regiment of Russian dragoons. In 2 cases V=$\frac{20}{30}$; in 3 V=$\frac{10}{30}$; in 17 V=$\frac{20}{40}$. The vision was binocular, and Jung's test-types were used.

21. TSCHERNING. Bidrag til su oftalmologisk statistik. Hospitalstitende, second series, vol. ix, No. 7. Copenhagen, 1882. 7564 recruits of the age of 22 were examined. Ametropia of less than 2 D was not considered. 6303 were from Copenhagen, the remainder from the country. Among the former myopia was found in 9.6%, hypermetropia in 4.35%; among the latter myopia in 2.16%, hypermetropia in 2.24%. Maculæ corneæ were found in 3.5% of the whole number, strabismus in 0.97%: 0.56% convergent, and 0.41% divergent squint. SCHIÖTZ.

22. UHTHOFF. Congenital anomalies of the globe and its adnexa in 10,000 eye-patients, with reports of cases. Schöler's annual report. Berlin, 1882. Conjunctiva 1 case, pigmentation. Cornea 12 cases: in 2 leucomatous opacity, in 6 cornea globosa, in 4 dermoid tumor. Uveal tract 19 cases: in 2 pupillary

membrane, in 4 embryonic threads, in 1 irido-choroiditis, in 3 coloboma of the iris, in 5 coloboma of the iris and choroid, in 1 defect in the choroid, in 3 albinism. Optic nerve and retina 14 cases: in 3 atrophy of the optic nerve, in 1 atrophic discoloration of the temporal half of the disc, in 9 opaque nerve fibres, in 1 congenital amaurosis without any ophthalmoscopic change. Lens 30 cases: in 4 zonular cataract, in 6 shrunken congenital cataract, in 3 nuclear cataract, in 5 cataracta mollis, in 2 congenital dislocation, in 4 posterior polar cataract, in 3 anterior pyramidal cataract, in 2 opacities of the anterior part of the capsule, in 1 an indentation at the lower inner edge of the lens, the lens being otherwise perfectly clear. Muscles 17 cases: in 10 congenital ptosis, in 3 nystagmus, in 1 paralysis of ext. rect., in 1 congenital immobility of both eyes, in 1 bilateral paralysis of the oculomotor nerve, in 1 convergent squint. Globe 2 cases: in 1 left-sided anophthalmus, in 1 hydrophthalmus. Lids 2 cases: in 1 epicanthus, in 1 double lower lachrymal point.

c.—OPHTHALMOLOGICAL JOURNALS.

German Journals.

23. *Arch. für Augenheilk.* Knapp, Schweigger, Vol. xi, 2. Issued Jan. 20, 1882.

24. *Klin. Monatsbl. f. Augenheilk.* Zehender. *January.* 1. Gunning. Are bacteria discharged from the body in the air breathed out? 2. Lewkowitsch. Two cases of interstitial keratitis; congenital partial symblepharon. 3. Rheindorf. A case of glaucoma with an acute opacity of the lens.—*February.* 1. Unterharnscheidt. A complete paralysis of the oculomotor nerve and accommodative lenticular astigmatism. 2. Landesberg. Jaborandi and pilocarpine in diseases of the eyes. 3. New instruments.—*March.* 1. Pflüger. The nutrition of the cornea. 2. Juhász. Case of atropine-poisoning cured by pilocarpine.

25. *Centralbl. f. prakt. Augenheilk.* Hirschberg. *January.* 1. Berger. Remarks upon the capsule of the lens. 2. Mandelstamm. A case of corneal fistula. 3. Mandelstamm. Injury to both eyes by a pistol-ball. 4. Wicherkiewicz. Some reflections on so-called warts of the globe. 5. A splinter of wood.—*February.* 1. Denk. An observation in circular and partial closure of the pupil. 2. Stilling. Some remarks on testing the color-sense. 3. Imre. A rare case of osteoma of the orbit. 4. Mayerhausen. Cases of visual disturbance after injury to the skull. 5. Mayerhausen. The removal of foreign bodies from the cornea.—*March.* 1. Weinberg. On diathetic retinitis. 2. Kroll. Contribution to the knowledge of neuro-paralytic keratitis. 3. Rübel. The scrofulous diseases of the conjunctiva and cornea, and their relation to the so-called scrofulous diathesis.

26. *Zeitschr. f. vergleichende Augenheilk.* Berlin, Eversbusch, 1882. I. Department of the journal for veterinary medicine and comparative pathology. In semi-annual volumes. 1. Berlin and Eversbusch. Introduction. 2. Wolfskehl. Astigmatism in the eyes of animals, and the significance of the slit-shaped pupil. 3. Berlin. The physico-optical structure of the eye of the horse. 4. Westrum. Observations of so-called choked disc in the dog. 5. Eversbusch. Comparative investigations on the finer structure of the iris.

The anatomical basis of the slit-shaped pupil. 6. Eversbusch. The most important contributions to the comparative anatomy of the eye for 1880. 7. Berlin. Pathology and therapeutics of diseases of the eye of animals for 1880.

French Journals.

27. ***Revue clinique d' oculistique du sud-ouest.*** Armaignac, Sichel, Meyer. No. 1. *January*, 1882. 1. Armaignac. Quelques considérations sur l' étiologie et le traitement de l' ulcère serpigineux de la cornée.—No. 2. *February*, 1882. 1. Armaignac. Cataracte capsulo-lenticulaire survenue rapidement chez un jeune homme à la suite d' une irido-choroidite ; opération et guérison.—No. 3. *March*, 1882. 1. Armaignac. Ankyloblépharon de la paupière inférieure et symblépharon partiel de la paupière supérieure consécutifs à un phlegmon traumatique de l' œil gauche ; traitement del' ankyloblépharon par la suture élastique de caoutchouc et du symblépharon par autoplastic conjonctivale ; libération complète et permanente des paupières permettant l' emploi d' un œil artificiel volumineux. Paralysie isolée et absolue du muscle droit supérieur chez une jeune fille de 17 ans à la suite d' une fièvre typhoide survenne à l' age de cinq ans. Paralysie congénitale complète du muscle droite supérieur gauche chez un enfant de 2 ans. Drainage des voies lacrymales.

28. ***Archives d' ophthalmologie.*** Panas, Landolt, Poncet, *January-February*, 1882, t. ii, No. 1. Bellouard. Kératite professionelle, incrustations plombiques de la cornée. Baudry. Sur l' emploi du prisme comme moyen de dévoiler la simulation de la cécité unilatérale. Leroy. Optique physiologique. Vision centrale, irradiation, et acuité visuelle. Tillais. Elephantiasis des paupières. Boucheron. De la cure du strabisme convergent intermittent par les mydriatiques ou les myotiques. Nicati. Remarques au sujet des conditions de vue exigées pour le service militaire.

29. ***Recueil d' ophthalmologie.*** Galezowski, Cuignet. No. 1. *January*, 1882. Mengin. Observation clinique. Galezowski. Migraine ophthalmique avec trombose des vaisseaux rétiniens. Galezowski. Des cataractes traumatiques. Despagnet. Cliniques ophthalmologique du Dr. Galezowski.—No. 2. *February*. Latteur et Despagnet. Observation avec examen histologique d' un cas de mélano-sarcome de la choroide. Brochet. Note sur le traitement chirurgical de l' ophthalmie granuleuse. Galezowsky. De l' influence des irites et des chorioidites sur le développement des cataractes. Aguilan Blanch. Périsclérite rheumatismale. Despagnet. Clinique ophthalmologique du Dr. Galezowski.—No. 3 *March*. Blanch. Périsclérite rheumatismale. Despagnet. Clinique ophthalmologique du Dr. Galezowski. Galezowski. Persistance des vaisseaux hyaloïdiens. Than. Des retractions consecutives aux paralysies musculaires.

30. ***Gazette d' ophthalmologie.*** No. 1. *January*, 1882. Carré. Note de thérapeutique oculaire. Traitement de la kératite ulcéreuse ou ulcère d' emblée. —No. 2. *February*. Carré. Note de thérapeutique oculaire. Traitement de la kératite interstitielle au parenchymateuse.—No. 3. *March*. Carré. Note de thérapeutique oculaire. Traitement de la kératite vasculaire ou pannus.

31. ***Annales d' oculistique.*** Worlomont. *January-February*, 1882. Giraud-Teulon. Sur lès systèmes chromatiques par Donders. Gayet. De la cure de l' entropion par une opération autoplastique. de Wecker et Masselon. Emploi de la galvano-caustique en chirurgie oculaire. Teillas. De quelque

tumeurs de la région orbitaire. Coppez. Neuralgie datante de 20 ans, guérie par l' élongation du nerf sousorbitaire.

32. *Revue générale d' ophthalmologie.* Recueil mensuel bibliographique, analytique, critique. Dor, Meyer. Paris. As collaborators of this new periodical are named: Carreras Aragó, Chodin, Cuignet, Goldzieher, Jacquemet, Magnus, Manfredi, Talko, Swanzy, Wicherkiewicz. No. 1. *January.* 1. Dor, Meyer. Introduction. 2. Gayet. Quelques conseils raisonnés à propos dest raumatismes oculaires et des premiers soins à leur donner. 3. Revue.—No. 2. *February.* 1. Dor. Kyste congénital de l' orbite, microphthalmie, colobome de l' iris et de la chorioide. 2. Revue.—No. 3. *March.* 1. Leroy. Sur la théorie de l' astigmatisme. 2. Revue.

Spanish Journals.

33. *La crónica oftalmológica.* Del Toro. *February.* Gastaldo. Luxacion del cristalino pór traumatismo en la cámara. Curacion y resultados satisfactorias.—*March.* Gastaldo. Iritis plastica con hipopion é infiltracion purulenta de la córnea. Curacion radical.

34. *Revista especial de oftalmológia, sifilografia, dermatologia, y afeciones urinarias.* Rodriguez Viforcos. *January.* Perez Caballero. La oftalmometrologia, sus procedimientos y aplicaciones. Cap. ii. Oftalmometria. Apreciacion de las dimensiones lineales, radios de curvadura é indices de refraccion. —*February* and *March* no original ophthalmological papers.

35. *Revista de ciencias médicas.* Carreras Aragó. *January.* Carreras Aragó. El oftalmoscopio de refraccion en los reconocimientos visuales. Carreras Aragó. La homatropina en las enfermedades de los ojos.—*February.* Riztol. Heridas de la córnea, iris, y cristalino producidas por una esquirla de piston, extraccion del enerpo extrano y curacion completa.—*March.* Aquilar Blanch. La excision del fondo del saco conjunctival en la granulosis.

Italian Journals.

36. *Annali d' ottalmologia.* Quaglino. *Anno* x, 6. Guaita. La microfotografia applicata all' anotomia patologica oculare. Lettera al Prof. Gayet. Nicolini. Cecità immediata permanente unilaterale successiva a trauma diretto sul bulbo. Ravà. Casuistica clinica.—*Anno* xi, 1. Amadei. Sulla craniologia delle anomalie di refrazione dell' occhio. Albertotti. Sulla determinazione sperimentale della grandezza dell' immagine oftalmoscopia rovesciata. Albertotti. Sulla micrometrà. Rampoldi. Anomalie di prima formazione dell' occhio.

37. *Bolletino oculistica.* Simi. *January.* Danesi. La sclero-coroidite.—*February.* Artikel gegen Specialärzte, die nicht das Allgemeinbefinden der Kranken berücksichtigen.—*March.* Moyne. Guarizione della cateratta incipiente. Falchi. Tuberculosi dell' occhio con glaucoma consecutivo.

38. *Giornale delle malattie degli occhi.* Morano. *Anno* v. *February.* Morano. Osservazioni cliniche.

English Journals.

39. *The Ophthalmic Review*, a monthly record of ophthalmic science. Grossmann, Smith. *January, February, March*, Nos. 3, 4, 5. Eales. Primary

hemorrhage in young men. Berry. Clinical notes and remarks on two unusual forms of strabismus. Smith. Atropine and eserine in glaucoma. Wood-White. Embolism of arteria centralis ; reëstablishment of circulation witnessed with the ophthalmoscope. McHardy. An improved self-registering perimeter. Smith. Atropine and eserine in glaucoma.

40. *Archives of Ophthalmology.* Knapp, Schweigger, vol. xi, No. 1, March.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

41. ABRAHAM. Micrococci in sympathetic ophthalmia. *Dublin Journal*, Feb., 1882.

42. BERGER. De l' observation du réflexe palpébral dans l' anesthésie chloroformique. L'acad. des scienc., Nov. 28, 1881. *Bullet. de thérap.*, Jan., 1882, No. 1.

43. BONAGENTE. Sulla sfinteratomia dell' iride nell' estrazione a piccolo lembo della cateratta e cura consecutiva. Atti dell' assoc. ottalm. ital., Sept., 1881. *Ann. d'ottalm.*, vol. x, 6.

44. BOUCHERON. De la cure du strabisme convergent intermittent par les mydriatiques ou les myotiques. *Arch. d' ophth.*, vol. ii.

45. BROCHET. Note sur le traitement chirurgical de l' ophthalmie granuleuse. *Rec. d' ophth.*, Feb. 1882.

46. BULL, C. S. Treatment of facial scars affecting the lids either directly or indirectly. *Trans. Amer. Ophth. Soc.*, 1881. Bull advises the systematic use of massage, and relates three cases in which this mode of treatment produced good results. BURNETT.

47. CABALLERO. La oftalmometrologia, sus procedimientos y aplicaciones. *Rev. esp. de oftalm.*, Jan., 1882. Chapter ii, Oftalmometria.

48. CARRÉ. Note de thérapeutique oculaire. *Gaz. d' ophth.*, Nos. 1, 2, 3. Discusses the treatment of the various kinds of inflammation of the cornea.

49. DANTONE. Sull' antisepsi nelle operazioni di cateratta. *Ann. d'ottalm.*, vol. x, 6. He earnestly recommends antiseptic treatment.

50. FALCHI. Tuberculosi dell' occhio con glaucoma consecutivo. *Ann. d'ottalm.*, vol. xi, 1.

51. DE FRIESS. Contribution à l' étude des pansements antiseptiques en chirurgie oculaire. *Thèse de Paris*, 1882. Prefers boracic acid; does not recommend the spray.

52. GALEZOWSKI. De l' influence des irites et des choroidites sur le développement des cataractes. *Rec. d' ophth.*, Feb., 1882.

53. GIRAUD-TEULON. Electrothérapie dans les opacités du corps vitré. Compt. rend. de l' acad. de méd., Oct. 18, 1881. *Gaz. d' ophth.*, March, 1882, No. 3.

54. GRADENIGO. Della profilassi antisettica nelle operazioni d' oculistica. Venice, 1882. He is opposed to all antiseptic substances; lukewarm water is best.

55. GUNNING. Are bacteria discharged from the body in the air breathed out? *Klin. Monatsbl. f. Augenheilk.*, Jan. A few oculists had expressed

the opinion, that in operations the air breathed out by the operator might be come dangerous to the eye through the bacteria contained in it. Gunning experimentally disproves this assumption, and comes to the following conclusions: 1. When the air is inhaled it is freed from the bacteria it contained. 2. No micro-organisms are discharged from the body in the air breathed out.

56. HIRSCHBERG. Ophthalmoscopy. *Realencyclopädie*, vol. x.

57. HIRSCHBERG. The reflex immobility of the pupil and a more accurate measurement of paralytic diplopia. Berlin, Gesellsch. f. Psych., Mar. 14, 1881. *Berl. klin. Wochensch.*, No. 8, 1882. *Arch. f. Psych.*, vol. xii, 2.

58. KLEIN. Massage in ophthalmology. *Wiener med. Presse*, 1882, No. 9.

59. KNAPP. On the extraction of cataract. Clinical remarks. *Med. Record*, vol. xxi, 7.

60. KRAUSE. Anatomical investigations of the ciliary nerves after opticociliary neurotomy. *Berl. klin. Wochenschr.*, No. 12. *A. f. A.*, vol. xi, 2. See No. 1 of last year's bibl.

61. KÜMMELL. On stretching of the optic nerve. *Deutsche med. Wochenschr.*, 1882, No. 1. The conjunctiva is incised in the lower outer quadrant, between the external and inferior recti, a squint-hook inserted between them and passed along the globe; and the optic nerve, felt as a tightly stretched cord, seized from above; a few strong tractions are then exerted. The connective tissue of the orbit is scarcely irritated at all by the operation. As to the therapeutic results of this procedure, which thus far has been tried in 7 cases, nothing can be said as yet.

62. DE LUCA. Nuovo metodo per chiudere l'apertura fistulosa del sacco lacrimale. Atti dell' assoc. ottalm. ital., Sept., 1881. *Ann. d'ottalm.*, vol. x, p. 6. The edge of the fistula is abscised.

63. MARTIN. Nouvelles applications du fer rouge en chirurgie oculaire et de quelques modifications apportées aux galvanocautères. *Journ. de méd.*, No. 2, Jan.

64. MAYERHAUSEN. The removal of foreign bodies from the cornea. *C. f. A.*, Feb. If the foreign body lies between the lamellæ of the cornea, a cystotome may be used with advantage.

65. MICHEL. On natural and artificial opacities of the lens. Essay in celebration of the 300th anniversary of the Julius-Maximilian University of Würzburg contributed by the medical faculty, Leipsic, 1882. If an ice-bag be placed on the eye of a young cat, a completely white opacity of the lens develops within a minute, which disappears in about the same time when the ice-bag is removed. Therefore, by reducing the temperature locally an artificial cataract was produced in the eye of the living animal, which again disappeared when the temperature rose through the agency of the restored circulation of the blood. In lenses removed from the eye an intense white opacity which advances from the periphery toward the centre, develops when they are subjected to a certain degree of either cold or warmth; that part of the periphery is first affected which is most exposed to the action of the cold or heat. The change of temperature must be rather sudden and its degree low or high. The opacity produced by cold has a decidedly yellowish tinge and a more or less perceptible lustre. The opacity produced by heat is of a chalky whiteness. The opacity due to

cold appears at the moment of freezing, and disappears as soon as the action of the low temperature ceases. The lens always clears up from the periphery toward the centre. During this process the lens-substance seems to be movable within the capsule, and if the capsule is opened, a large quantity of clear liquid escapes. Besides this aqueous discharge the so-called lens-sutures become much more distinct, and even a bursting of the lens-substance corresponding to the sutures can be demonstrated. When exposed to a temperature of 80° a white opacity rapidly develops, which never again disappears. The lens is then dry and easily crumbled. Salt produces an opacity in the lens of the frog, but the centre of the lens remains transparent. Speaking generally, there are three types of cataract produced by salt, namely: 1, opacity of the corticalis and the outer layers of the nucleus; 2, opacity of the nucleus; 3, opacity of a layer between nucleus and cortex, a so-called perinuclear cataract. The opacity of the lens does not find its optical expression in the loss of water; on the contrary, a certain percentage of water is necessary to let it become visible, and the loss of water must not go beyond a certain limit. Two factors are essential for the formation of an opacity, a physical and a chemical one: of the former kind are the temperature and the loss of water; of the latter, the character of the albuminous substances. The physical factors cause the formation of new chemical bodies which possess different qualities and therefore manifest themselves optically in the form of an opacity of the lens.

The reporter would here call attention to the artificial production of cataract, which Neuner advised as early as 1827 (Graefe u. Walther, *Journ. d. Chirurgie*, vol. x, 4, pp. 480-492) in order to learn the operation. Neuner injected a solution of sublimate into the lens, which then becomes opaque and hard, and therefore well qualified for practising the operation. Of course an artificial cataract is only produced in a lens which is in its normal position.

66. MINOR, J. S. Central color-scotoma—the error of ordinary tests. *Amer. Journ. Med. Sci.*, April, 1882. M. points out the deficiency of the usual method of examination for central scotoma, especially where the color-sense is only partially deficient. The plan which is in most common use is to cause the eye to fix a small bit of color and then advance another bit of color from the periphery of the visual field toward the centre until its brilliancy is diminished to that of the central color. When this is done in all meridians the limit of the scotoma is outlined. Owing to the diminution of retinal sensibility from fatigue, however, this is not a fair gauge of the central diminution of color-perception. In order to obviate this, M. proposes that a disc of colored paper larger than the scotoma be placed before the eye, and the patient be directed to outline on this his scotoma. A series of these discs taken at various sittings would show the progress of the case. BURNETT.

67. MORANO, DEL MONTE, BONAGENTE, ANGELUCCI deny that the corneal opacity after cataract-extration is due to parasites. Atti dell' assoc. ottalm. ital., Sept., 1881. *Ann. d. ottalm.*, vol. x, 6.

68. MOYNE. Guarigione della cateratta incipiente. *Bollet. d' ocul.*, March.

69. OELLER. Contributions to the comparative anatomy of the cornea, resp. Descemet's membrane. Biological contributions. Jubilee paper for Geheimrath von Bischoff. Munich, 1882. Published in pamphlet form. 1. The

intercellular spaces and the intercellular vacuoles of the endothelium of Descemet's membrane. The reason chiefly lies in a change in the chemical composition of the aqueous humor. 2. The relations between the red and white blood-corpuscles which have entered the anterior chamber and the endothelium of Descemet's membrane.

70. PETTORELLI. Sul delirio consecutivo all' estrazione della cateratta. *Gaglidmo da Salieto*, vol. iii, 7. Discusses an article of Saltini (Spallanzani, Jan., 1881) on 5 cases of delirium after cataract-operation observed at the clinic in Modena, and endeavors to show that they were in reality cases of atropine poisoning. DANTONE.

71. PFLÜGER. Ophthalmic clinic of the university of Berne. Report for the year 1880. A mixture of 1½% carbolic acid with 4% boracic acid is recommended as the best antiseptic. 5% solution of resorcin for cleansing the instruments. Resorcin is not brought into direct contact with the eye on account of its irritating action. Hydrochinon is apt to cause dermatitis and colors the patient's face brown. It cannot, therefore, be recommended. Carbolic acid 2–2½%, when chemically pure, is not objectionable; if this is not the case, it easily produces ulcers of the cornea.

72. REID. Removal by electro-magnet of a piece of iron seen in the vitreous. *Glasgow Med. Journ.*, March, 1882. Caused suppurative panophthalmitis.

73. RIBEZZI. Del danno che arrecano i caustici nella cura delle granulazioni palpebrali. Atti dell' assoc. ottalm. ital., Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. Is opposed to all cauteries.

74. SCHÖLER. Case of scleral puncture of the retina. Schöler's annual report for 1881. Detachment of the retina completely cured by puncture, but in a few weeks a relapse followed.

75. SCHRÖDER. A new method of splitting the capsule in operating for senile cataract. *Berliner klin. Wochenschr.*, 1882, Nos. 2 and 3. The capsule is split in the centre in the whole length of the vertical meridian. Three lateral incisions are added, beginning from the vertical cut. Out of 42 eyes 41 obtained $V > \frac{20}{200}$; one eye was lost; once there was a moderate loss of vitreous without any injurious consequences.

76. SCHUCHARDT. Tuberculosis vaccinated upon the eye, and its connection with general vaccinated tuberculosis. *Virchow's Archiv*, vol. lxxxviii, 1. In most cases the vaccinated tuberculosis was confined to one or both eyes, and the rest of the body remained healthy.

77. SCELLINGO. Blefaroplastica esequita col processo di Fricke modificato. *Ann. d' ottalm.*, vol. x, 6.

78. DE VINCENTIIS. Sulla blefaroplastica. *Ann. d' ottalm.*, vol. x, 6.

79. DE WECKER and MASSELON. Emploi de la galvano-caustique en chirurgie oculaire. *Ann. d' ocul.*, Jan., Feb., 1882.

80. WHITE, J. A. A simple way of performing optico-ciliary neurotomy. *Va. Med. Monthly*, Dec., 1881. He makes the incision in the conjunctiva between the upper and outer recti. A strabismus-hook is then inserted under each of these muscles, and by them the eye is pulled down and toward the

nose. The wound is then rendered more open by inserting a small lid-elevator under the upper lid of the incision. Through this opening the scissors are introduced and the nerves divided. The eye is then rotated on its axis by the double hook of Knapp, and the posterior part of the sclerotic is carefully cleaned. He has operated on three cases with success by this method.

BURNETT.

III.—INSTRUMENTS AND REMEDIES.

81. BLIX MAGNUS. En sjelf registrerande perimeter. *Upsala läkaref är. Förhandl.*, vol. xvii, Nos. 2 and 3.

82. BRANE. A blade-holder. *Klin. Monatsbl.*, Feb. The angle between the blade and handle can be varied to any extent. The blade can be screwed into the holder. Can be obtained from the maker, Brand, in Altona.

83. CARREROS-ARAGÓ. La homatropina en las enfermedades de los ojos. *Rev. de science med.*, Jan., 1882.

84. CHISOLM, J. J. A singular case of hostility to the local use of atropia and duboisia; the first causing facial erysipelas, the second temporary insanity in a patient 70 years of age. *Maryland Med. Journ.*, Dec. 15, 1881.

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85. CUISNIER. De la pilocarpine dans la thérapeutique oculaire. *Semaine méd.*, Jan., 1882, No. 4. In incipient atrophy of the optic nerve. Care must be taken in patients suffering from heart disease or atheromatous degeneration.

86. EMMERT. Hyoscinum hydrojodatum. *A. f. A.*, vol. xi, 2. Its myotic action is very powerful and is surpassed by no other remedy. A solution of 0.01 : 10.0 is sufficient. The conjunctiva bears it well.

87. FRONMÜLLER. Poisoning by pilocarpine. Atropine as an antidote, also homatropine. *Memorabilien*, vol. ii, 1.

88. MCHARDY. An improved perimeter. *Lancet*, No. 4. *Ophth. Review*, vol. i, No. 5.

89. VON HASNER. Keratoscopy. Society of German physicians of Prague, March 10, 1882. *Prag. med. Wochenschr.*, No. 13. *Centralbl. f. prakt. Augenheilk.*, March. Recommends the apparatus of Placido (*v.* below, Placido); it may be used either as a tonometer or astigmometer.

90. JUHÀSZ. Case of atropine-poisoning, cured by pilocarpine. *Klin. Monatsbl.*, March.

91. KÖNIG. Leucoscope. Phys. Gesellsch. zu Berlin, Feb. 16, 1882. *Centralbl. f. prakt. Augenheilk.*, Feb. Instrument for testing the relative power of emitting light in various sources of light.

92. LANDESBERG. Therapeutic use of jaborandi and pilocarpine in eye-disease. *Med. & Surg. Rep.*, vol. xlvi, No. 5. Opacities of the lens were observed in five cases in man, and one in a horse after the use of pilocarpine.

93. LANGE. Iodoform in blennorrhœa neonatorum. *Petersburg. med. Wochenschr.*, 1882, No. 10. Acts injuriously; luxuriating granulations develop upon the conjunctiva, which finally become so extensive as to injure the nutrition of the cornea, and thus favor the development of corneal lesions.

94. PAJZDERSKI. The action of iodoform salve in ophthalmology. *Inaug. Dissert.*, Greifswalde, 1882. One part of iodoform to fifteen of vaseline. Contra-indicated in iritis. Very useful in clearing up the cornea in scrofulous pannus and maculæ corneæ.

95. PAULSEN. Safety apparatus on the spatula. *Klin. Monatsbl.*, March. A little stop on the spatula is intended to prevent it from entering too far into the eye.

96. PLACIDO. Keratoscope. *Centralbl. f. prakt. Augenheilk.*, Jan., Feb.

97. SALTINI. Sulla efficacia del solfato de eserina nella cura delle affezioni glaucomat. *La Spallanzani*, vol. xi, 1 and 2, Jan., Feb., 1882. Effective in the prodromal stage and in acute attacks of glaucoma; makes iridectomy easier.

98. SCHENKE. Atropine-vaseline. *Prager med. Wochenschr.*, 1882, Nos. 1 and 2. Is more effective than the solution and does not have its disadvantages.

IV.—ANATOMY.

99. BENSON. On coloboma of the choroid and of the optic nerve sheath. *Dublin Journ.*, March, 1882.

100. BERGER. Remarks on the capsule of the lens. *Centralbl. f. prakt. Augenheilk.*, Jan., 1882. The capsule consists of lamellæ, of which the outermost one is connected with the zonula Zinii; the lamellæ are united by a cement which is loosened or dissolved in a solution of permanganate of potash. There are nuclei in the lens-capsule of the fœtus. The lens-capsule may be classed as connective tissue.

101. EVERSBUSCH. Comparative studies on the finer structure of the iris. I. The anatomical reason of the slit-shaped pupil. First communication. *Zeitschr. für vergleich. Augenheilk.*, 1882. I. The following observations were made on the horse: 1. An uninterrupted muscular layer, as it has been described in man and the rabbit, does not exist in the iris of the horse. There are no arcades as can be shown to exist between the dilatator and sphincter pupillæ in man and the rabbit. The connecting links between the dilatator and sphincter pupillæ are simply muscular bands, the arrangement of which may be best compared to the spokes of a wheel. The oblong shape of the pupil of the horse is explained by the existence of an auxiliary apparatus which is attached to the posterior surface of the lens at points corresponding to the shorter diameter, which might be called ligamentum inhibitorium or triangulare iridis.

102. GALEZOWSKI. Persistance des vaisseaux hyaloidiens. *Rec. d' ophth.*, March, 1882.

103. GREFBERG. On the development of Meibom's glands. Communications from the embryological institute of the university at Vienna. Vol. ii, No. 2. Vienna, 1882.

104. HENLE. The development of the crystalline lens and the subdivision of the nucleus. *Arch. f. microsc. Anat.*, vol. xx.

105. LITTLE, W. S. Two cases of persistent hyaloid artery. *Phila. Med. Times*, 1881, and *Trans. Amer. Ophth. Soc.*, 1881.

106. MICHEL. The corneal ridge of the human embryo. Paper in honor

of the 300th anniversary of Würzburg University. Leipzig, 1882. Measurement at different periods beginning with the 5th month. The character of the corneal ridge in the embryo is important in its bearing on certain congenital anomalies of the cornea, for instance megalophthalmus, keratoglobus, keratoconus, and anomalies of curvature.

107. PARINAUD. Nerfs optiques et hémisphères. *Compt. rend. hebd. des séances de la soc. de biologie*, No. 10, March 10. *Gaz. des hôp.*, No. 12, 33.

108. PONCET. De l' état du nerf optique et de la rétine chez un ataxique, aveugle depuis dix ans. *Progr. méd.*, No. 8, Feb.

109. PREISS. The lymph-spaces of Descemet's membrane and their connection with the cornea. At the same time a contribution to the knowledge of the anastomosing corneal cells and their termination on the surface of the endothelium. *Virchow's Arch.*, vol. lxxxvii, 1. On the posterior surface of the cornea a system of tubes (lymph-ducts) can be demonstrated, which lie within the endothelial cells and their immediate substratum. The tubes are connected with the spaces between the endothelial cells and their nuclear membranes, and also with the lacunar spaces.

110. RAMPOLDI. Anomalie di prima formazione dell' occhio. *Ann. d' ottalm.*, vol. xi, 1.

111. RISLEY, S. D. A new trial-glass frame. *Trans. Amer. Ophth. Soc.*, 1881. Two bars which slide past each other through a wedge-shaped block, have attached to them the two semicircular grooves for holding two lenses, with some hooks by which an additional lens can be added. This arrangement allows of a lateral movement of the lenses amounting to 16 *mm.*, or a pupillary distance varying from 50 to 66 *mm.* It can be held in the hand by means of a handle, or the ordinary spectacle bows can be attached. BURNETT.

112. RITTER. The eye of an acranius histologically examined. *A. f. A.*, vol. xi, 2. Shape of the eye and of its different parts normal; the microscope also showed no deviation from a normal structure. Every layer of the retina was found; only the nerve-fibres, except a small number, were wanting; and the ganglion cells had not quite reached their usual development.

113. SCHMIDT-RIMPLER. Opticus. *Realencyclopädie*, vol. x.

114. SPINA. On absorption and secretion. Leipzig, 1882, chap. xxiii. Investigations of the living epithelium of the cornea. The variations in volume of the epithelial cells of the cornea of the frog; on adding blood-serum or water the epithelial layer becomes higher and the separate cells become more distinct. The same is the case when the cornea is tetanized or mechanically irritated.

V.—PHYSIOLOGY.

a.—GENERAL PHYSIOLOGY: OPTICS, CORNEA, IRIS, REFRACTIVE MEDIA.

115. ABADIE. Du vertige oculaire. *Progr. méd.*, Jan. 1882, No. 1. In some cases the patients become dizzy when looking in certain directions or when moving the eyes.

116. BERLIN. The physico-optical structure of the eye of the horse. *Zeitschr. f. vergleich. Augenheilk.*, 1882, vol. 1. The eyes of the horse, as

of all domestic animals, perhaps even of all vertebrates, are hypometropic. They show two kinds of astigmatism: one is irregular and due to a certain difference of refraction in layers of the lens equally far from the surface; the other is regular and ascribable to the asymmetry of the meridians of the cornea. The latter kind seems to have a definite character, inasmuch as the meridian of least curvature coincides with the longest diameter of the horizontally oval pupil (*v.* Wolfskehl, this bibl.), while the meridian of greatest curvature is about perpendicular to the longest diameter.

117. CHARPENTIER. Remarques sur la sensibilité différentielle de l' œil. *Arch. d' ophth.*, 1882, Jan., Feb., No. 2. He means by this expression the power to distinguish between two different degrees of intensity of light. The sensibility varies when the different intensities act simultaneously upon the eye or in succession: when two intensities act upon the eye at the same time, they must differ by one hundreth; when successively, by 7 or 8 one hundreths.

118. EHRLICH. On induced fluorescence in the eye. *Deutsche med. Wochenschr.*, 1882, Nos. 2–4. Ehrlich recommends subcutaneous injections of fluoresceïn for studying the changes of nutrition, which cause very intense phenomena of fluorescence in the eye. He has shown by these experiments, that the anterior surface of the iris has nothing to do with the reproduction of the aqueous humor, which comes entirely from the posterior chamber. The liquid is not derived from the vitreous by transudation, but is principally secreted by the blood-vessels of the ciliary body. Under normal conditions the aqueous humor is secreted in an entirely different manner; two centres of secretion exist at the periphery of the iris, an anterior nasal and a temporal one; they throw the liquid with a certain force and in a fixed direction upon the posterior surface of the cornea, after which the stream moves in a horizontal direction. An angle is formed at the point where the currents meet. The secretion of the posterior chamber is widely different from the aqueous humor.

119. GRADENIGO. Dell' ascoltazione dell' occhio. *Ann. d'ottalm.*, vol. x, 6. Three kinds of sounds may be heard on the eye: 1. A muscle-sound, resembling the humming of flying insects. 2. Sounds heard at in- and expiration and due to the respiratory organs, as the nose, etc. 3. A sound heard when the muscles contract; it is clearly defined and can be easily distinguished from the others. DANTONE.

120. KESTEVEN. Xanthopsis. *Lancet*, No. 5.

121. KRONER. The perceptions of the new-born. *Breslauer ärztl. Zeitschr.*, Feb. 18, 1882, No. 4. A new-born child cannot control the motions of the muscles of the eye. There is perception of light. The reflex-arch from the optic nerve to the facial nerve supplying the lid and the branch of the oculomotor nerve supplying the iris is completely developed. In regard to the motion of the eyes he is inclined to think that at birth there is no preformed nervous mechanism ready to exercise binocular symmetrical vision.

122. LEROY. Optique physiologique, vision centrale, irradiation, et acuité visuelle. *Arch. d' ophth.*, Jan., Feb., 1882.

123. MACÉ and NICATI. Relation entre la loi de Bouguer-Masson et le phénomène de Purkinje. *Compt. rend. des séances de l' acad.*, Mar. 20, 1882.

124. MORIGGIA. The movements of the iris and their mechanism under

various conditions and in different animals, especially rabbits and goats, studied when mydriasis is produced by atropine or irritation and division (?) of the sympathetic nerve. Moleschott's investigations on the natural history of man and animals. Vol. xiii, 1. Giessen, 1882.

125. PFLÜGER. The nutrition of the cornea. *Klin. Monatsbl.*, March. The cornea is not nourished by the aqueous humor, as Knies and Weiss erroneously maintain, but from the conjunctiva and sclera. In general the conjunctiva nourishes the superficial, the sclera the deeper layers of the cornea. Within the cornea the lymph-current flows in a centripetal direction from all points of the periphery, then turns inward and enters the aqueous humor. No centrifugal countercurrent of any consequence from the aqueous humor into the cornea exists.

126. SCHÖLER and UHTHOFF. The significance of fluoresceïn for the exchange of liquids in the eye. Annual report for 1881. Berlin, 1882. They come to the following results: 1. Under normal conditions the iris does not cut off the communication between the anterior and posterior chambers, the aqueous humor being constantly renewed from the latter. 2. A current passing from the vitreous through the zonula or Petit's canal and the iris into the anterior chamber does not exist. 3. The anterior surface of the iris does not take part in the renewal of the aqueous humor, which is derived from the blood-vessels of the ciliary body and the posterior surface of the iris, the "secretory angle." This current gives rise to Ehrlich's line, which always begins behind the iris at the edge of the pupil. 4. The secretion from the "angle" does not take place simultaneously over its whole surface. 5. The greater part of the current which exists in the eye flows along the iris through the pupil into the anterior chamber, a smaller portion of it going into the lens through Petit's canal and into the vitreous. Vitreous and anterior chamber are therefore not separated from each other. 6. If the fluoresceïn before its discharge has passed the vascular system of the eye (subcutaneous injection), only a small part of it enters the lens and vitreous, the effect of which soon disappears. If, however, it is injected into the anterior chamber, a large proportion is absorbed by the lens; but when injected into the vitreous, it enters the lens only when it has previously passed into the anterior chamber. 7. The colored fluid is absorbed by the lens from the corticalis toward the nucleus, and disappears in the same order. The innermost parts of the nucleus become colored only after two to three weeks. 8. The vitreous does not participate in the nutrition of the lens, as the latter remains uncolored for days though the whole vitreous is deeply stained, provided the aqueous humor had not previously become colored. This latter event, after an injection into the vitreous, favored and produced as it is by an increase of tension in the vitreous and a decrease in the anterior chamber, does not take place through physiologically pre-existing paths. 9. Opening the anterior chamber (puncture, sclerotomy, iridectomy) changes both the quantity and quality of the fluid discharged from the secretory angle, and in this manner influences the nutrition of the lens and vitreous. 10. The secretion of the aqueous humor is controlled by nervous influence. Division of the cervical branch of the sympathetic nerve, with or without excision of the superior cervical ganglion, causes the appearance of the colored secretion in half the normal time, and decreases the quality of the secreted liquid. The subcutaneous injection of fluoresceïn

is therefore a new method of determining trophoneuroses of the eye which thus far could not be diagnosticated. Secretory and oculo-pupillary fibres of the sympathetic nerve spring with separate roots from the spinal cord, so there are special secretory nerves for the eye. 11. Intracanial division of the trigeminus hastens, increases, and changes the secretion of the eye still more than division of the cervical branch of the sympathetic nerve. 12. As division of $\frac{3}{4}$ of the nerve in the posterior section of Gasser's ganglion does not alter the secretion in the eye, provided the most medial part be preserved, the secretory fibres must be within the medial fourth.

127. STELLWAG VON CARION. On central vision. Papers on practical ophthalmology. Vienna, 1882, chap. 5. 1. The formula of Snellen is not suited to express with any degree of accuracy the ratio of the visual power of different eyes to each other and to a standard universally agreed upon. 2. To determine this ratio, all the factors which influence the size and brightness of the retinal images, should be accurately known in each case, so that they can enter into the calculation as fixed numbers. 3. As this is practically impossible, we must confine ourselves to determining the power of an eye by giving the greatest distance at which, under good illumination, it can easily and accurately recognize certain objects. 4. The test-types prepared for this purpose are the most suitable objects. 5. The power of the eye must first be tested for the various distances which fall within the range of distinct vision in accordance with the refraction and accommodation, so that auxiliary lenses are unnecessary. The finest type which the eye can see is first determined, and then the greatest distance at which it can be read ; if the position of the far point permits it, the same experiment is made with print of medium and large size. 6. Correcting glasses are used for distances beyond the range of distinct vision. 7. The examination should be carried on in bright daylight falling from one side upon the test types. 8. The results arrived at should be reported without any changes, but the kind of refraction and breadth of accommodation added.

128. VON VINTSCHGAU. Farther observations on the movement of his own iris. *Arch. f. d. ges. Phys.*, vol. xxvii, 3 and 4.

129. WOLFSKEHL. Astigmatism in the eyes of animals and the significance of the slit-shaped pupil. *Zeitschr. f. vergleich. Augenheilk.*, 1882, vol. i. The eyes of calves and cats show a marked corneal astigmatism ; in the eye of the cat the meridian of least curvature always coincides with the longest diameter of the pupil ; this seems to indicate that in this animal there is a constant relation between the slit-shaped pupil and the asymmetric refraction. It might be defined more accurately by saying that the eye of the cat, when the pupil becomes slit-shaped under the influence of light, not only excludes in a very perfect manner all the rays which undergo irregular refraction through the cornea, but also reduces the refractive power.

b.—RETINA, OPTIC NERVE, CENTRAL ORGANS, ACCOMMODATION MUSCLES.

130. ANGELUCCI. L' azione della luce e dei colori sull' epitelio retinico. *Ann. d' ottalm.*, vol. x, 6. *Italia medica*, 1882, No. 5. *Gaz. med. di Roma*, 1882, No. 1. Continuation of the investigations begun by Boll on the physiological importance of the pigment epithelium of the retina. Under the influence of light the grains of pigment wander through the layer of rods and

cones, a phenomenon which is not observed in the dark. The pigment cells, however, never retire completely from the rods, but constantly inclose the outer third. The time necessary for the ascent and descent of the pigment is exactly the same as that observed in the appearance and disappearance of the visual purple. In 6-10 minutes the visual purple is bleached under the influence of light, and the same length of time is required by the pigment to inclose the rods. In 1-1½ hours the visual purple is reproduced, and the same time is required for the return of the pigment to its original position away from the rods. The pigment epithelium is intended for the protection of the rods, especially to neutralize in connection with the reaction of the pupil the varying intensities of light upon the sensitive elements of the retina. Colored light has a varying influence on the movement of the epithelium. After an hour's exposure to red light the pigment does not change its position; yellow rays only cause a slight movement, but it is very marked in green and blue light; it becomes perceptible after an exposure of 10-15 minutes. Under colored light the movement does not depend upon the intensity, but upon the wave-length. As regards the nature of this movement, Angelucci says that the grains of pigment really move along the offsets of the cells.

131. MICKLE. Localization of the visual centres of the cerebral cortex. *Med. Times and Gazette*, 1648.

132. SCHMIDT-RIMPLER. The specific reaction of the optic nerve for mechanical irritation. *Centralbl. f. d. med. Wissensch.*, 1882, No. 1. Direct irritation of the optic nerve with a pear-shaped electrode in patients whose eyes had recently been enucleated, showed that the optic nerve has a specific reaction, which manifests itself to the patients as a sensation of light.

133. STELLWAG VON CARION. The breadth of accommodation and its relation to the choice of glasses. Papers on practical ophthalmology. Vienna, 1882, chap. vi, p. 301.

c.—PERCEPTION OF COLORS.

134. BAYER. On acquired color-blindness. *Prager med. Wochenschr.*, Nos. 4 and 5.

135. DONDERS. New researches on the systems of color-sense. Utrecht, 1882.

136. VON FLEISCHL. The theories of color-perception. *Wiener med. Jahrb.*, 1882. *Vide* our last year's bibl.

137. GORHAM. On the blending of colors, by the sole agency of the sensorium. *Brain*, vol. xvi.

138. HÄUSELMANN. Popular treatise on color-perception. Zurich, 1882. With eight colored plates. For use in academies, high-schools, seminaries, trade-schools, and self-instruction of artists and laymen. It is divided into a theoretical and a practical part. The former contains the commonest physiological and physical phenomena; the latter treats of the use of colors in painting. He accepts the evolution of the color-sense from the light-sense, and advocates educating the color-sense.

139. HILBERT. The perception of the phenomena of fluorescence by the color-blind. A physico-physiological study. Königsberg, 1882. The color-

blind observe the fluorescence of such bodies only whose colors they can perceive, and although the fluorescent light is composed in each case of several kinds of homogeneous light, they generally do not recognize the components, although they may belong to their system of colors. Totally color-blind persons very probably cannot observe fluorescence in any substance, the red-green blind only in substances which fluoresce blue or yellow, the blue-yellow blind only in such as fluoresce red or green. Fluorescent substances should be well adapted for diagnosticating color-blindness. This method, however, cannot be employed in the examination of large numbers of people, as sunlight alone can be used. Another objection is that the person to be examined is asked the color of the fluorescent substance. On account of the difference between the perception of colors by the color-blind and the normal eye it is not advisable to ask the names of colors. Besides, Hilbert did not employ Holmgren's test in the manner prescribed, but in the less reliable modification with light-red worsteds as test I. Good results were obtained with Stilling's plates. Declares in favor of Hering's theory.

140. JEFFRIES. Color-names, color-blindness, and the education of the color-sense in our schools. *Educational International Magazine*, vol. ii, 4, Mar.-Apr., 1882. Advocates the system of Magnus.

141. MACGOWAN. Color-blindness. *Lancet*, Jan., 1882. Among 1,000 Chinese and Japanese not one color-blind person.

142. SANROMAN. Estudios sobre el Daltonisme aplicado a la navegacion. *Bolet. de med. naval.*, Jan., 1882. Continued.

143. SCHUBERT. Perception of color and color-blindness. Paper read before the society for natural history at Nürnberg, Feb. 22, 1882. Correspondent für Deutschland, 1882, Nos. 111–139.

144. STILLING. Some remarks on testing color-perception. *Centralbl. f. prakt. Augenheilk.*, Feb. Argues against Mauthner, who denies the utility of the colored shadows and pseudo-isochromatic plates for diagnosticating color-blindness.

145. THOMPSON. The practical examination of railway employees as to color-blindness, acuteness of vision and hearing. *The Med. News*, Jan., 1882. The paper criticises the resolutions of the ophthalmic section at London, which he cannot subscribe to or sanction. Stilling's method can only be employed by skilled specialists, and can therefore not be introduced generally. Holmgren's method is undoubtedly the best. He has described a modification of this method; as it only affects minor details, he refers to the paper itself.

B.—ANOMALIES OF REFRACTION AND ACCOMMODATION, LIDS, LACHRYMAL APPARATUS, MUSCLES AND NERVES, ORBIT AND NEIGHBORING CAVITIES, CONJUNCTIVA, CORNEA, AND SCLEROTIC.

BY DR. C. HORSTMANN.

I.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

146. BERTIN-SANS. Le problème de la myopie scolaire. *Ann. d' hyg.*

publ., Jan., 1882. The paper treats of myopia caused resp. aggravated by study at school, and the steps to be taken to prevent it.

147. AMADEI, GUISEPPE. Sulla craniologia delle anomalie di refrazione dell' occhio. *Ann. d' ottalm.*, vol. xi, p. 3. Discusses the influence of the formation of the skull on the kind of refraction.

148. LEROY. Sur la théorie de l' astigmatisme. *Rev. génés. d' ophth.*, 1882, No. 3.

149. ADAMS. Exceptionally high degree of spasm of accommodation. *The Lancet*, 1882, No. 4.

II.—LIDS.

150. HASNER. Ankyloblepharon filiforme adnatum. *Zeitsch. f. Heilk.*, vol. ii, p. 429. In a child 2 days old a thread of skin 1 *cm.* long and as thick as a thread, was found stretching from the outer margin of one lid to the other, which tore on the fourth day. It consisted of neoplastic fibrillary tissue.

151. ARMAIGNAC, H. Ankyloblepharon de la paupière inférieure et symblépharon partiel de la paupière supérieure consécutif à un phlegmon traumatique de l' œil gauche. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 3, p. 49. Armaignac operated an ankyloblepharon and a partial symblepharon, caused by a traumatic phlegmonous inflammation, by ligating the former with a rubber suture, and by transplanting a conjunctival flap upon the latter. The lids remained freely movable and permitted the use of an artificial eye.

152. LEWKOWITSCH. Congenital partial symblepharon. *Klin. Monatsbl. f. Augenheilk*,, vol. xx, p. 14. In a boy 12 years old a horizontal bridge of mucous membrane without blood-vessels was found, which sprang from the inner surface of the outer canthus and ended with a fan-shaped insertion on the posterior part of the conjunctiva.

153. GAYET. De la cure de l' entropion par une opération autoplastique. *Ann. d' ocul.*, 1882, p. 27. Gayet operates for entropium by making an incision parallel to the edge of the lids at the inner part. Then he prepares a flap of the same length as the wound at the inner portion from the outer portion of the lid, reverses the flap, and fastens it to the inner side.

154. TOSSWILL. Ectropion successfully treated by transplantation of skin from the arm. Mr. Louis Tosswill, of Exeter, reports a case of ectropion, due to an extensive burn, which was successfully treated by this method. The eversion of the lids was so extensive before the operation that the globe was exposed during sleep. This was rectified by the operation, and the transparency of the inflamed and opaque cornea was restored. *Brit. Med. Jour.*, Jan. 7, 1882, p. 9. FITZGERALD.

155. LAWSON, G. Ectropium of the upper lid remedied by transplanting a piece of skin from the arm. *The Lancet*, Jan., 1882, p. 13. Lawson operated for ectropium by transplanting a piece of skin from the arm, with good result.

156. ABADIE. De l' autoplastie des paupières. *L' union méd.*, 1882, No. 8, p. 87. In a girl 20 years old an ectropium was formed after an extensive destruction of the skin, the forehead, and the temple by burn. The edge of

the lid was freed by a cut 6 *cm.* long, and a piece of skin taken from the arm transplanted into it, which healed in well. The author advises to keep the transplanted flap warm during the first 48 hours. V. MITTELSTÄDT.

157. RAMPOLDI. Fimosi e ptosi palpebrale congenita atrophica. *Ann. d' ottalm.*, vol. xi, p. 31. Rampoldi reports a case of congenital phimosis and ptosis. The muscles of the lids were completely atrophic.

158. BAJARDI, DANIELE. Dell' adenite scrofulosa in rapporto con alcune affezioni oculari. *Gaz. degli ospitali.* The author discusses scrofulous blepharadenitis and its connection with other ocular affections.

159. GERIN-ROZE. Blépharite tuberculeuse. *Gaz. méd. de Paris*, No. 9.

160. PFLÜGER (Rep. of the ophthalmic clinic of Berne University for 1880, Berne, 1882, p. 49) describes a syphilitic ulcer of the lid. The inner angle of the right eyelid was wanting; an ulcer with a lardaceous fundus and sharp margin had formed in its place; its surroundings were hard and infiltrated. Cured by antisyphilitic treatment.

161. BUSINELLI. Un caso di degenerazione amyloide del tarso. *Ann. di ottalm.*, vol. x, p. 6. The disease had existed for 10 years, and was especially marked in the lower lid. Normal appearance was restored by removing the degenerated tarsus. Histologically the case resembled that observed by Vogel and reported in *Graefe-Saemisch*, vol. iv, p. 442. DANTONE.

162. TEILLAIS. Éléphantiasis des paupières. *Arch. d' opth.*, vol. ii, No. 1, 1882. In a woman 75 years old a large, fluctuating tumor of both upper lids was found, which hung down upon the cheeks. It contained a serous liquid. Both tumors were excised. The microscopic examination showed reticulated connective tissue, with small and large meshes, atheromatous degeneration of the blood-vessels, marked development of the lymph-vessels, and around them an infiltration of round cells.

163. WHERCY. Chancre on eyelid. *The Lancet*, No. 4.

164. HALL. Contribution to the knowledge of the connection between blepharitis ciliaris and ametropia. *N. Y. Med. Rec.*, April 15, 1882. Among 10 cases of blepharitis ciliaris, 9 showed some kind of ametropia.

165. HIRSCHBERG (*Berl. klin. Wochenschr.*, No. 4) observed a case of blepharitis which was caused by phthiriasis pubis on the lashes.

166. FINNY (*Dublin Journ. of Med. Sci.*, March, 1882, p. 201) reports a similar case.

167. CASPER. Abscess of the lid in connection with caries of the roots of the teeth. *Centralbl. f. A.*, 1882, p. 106. Casper reports 2 cases, of a woman and a child, in which abscesses of the lids developed in connection with abscesses due to dental caries.

168. REID. Epithelioma of upper eyelid. *Brit. Med. Journ.*, Feb. 4, 1882, p. 160. The tumor, which had existed for 10 years in a man of 68, occupied the greater part of the upper eyelid and extended downward over the inner canthus. The tumor had taken origin from the sudoriferous glands. Patient's father and elder brother had died from the same disease of the lip.

FITZGERALD.

III.—LACHRYMAL APPARATUS.

169. ARMAIGNAC. Drainage des voies lacrymales. *Rev. d' ocul. du sud-ouest*, vol. iii, No. 3, p. 58. Armaignac recommends drainage in severe cases of dacryocystitis.

170. SBORDONE. Excissione della parete anteriore o estirpazione dell' intero sacco lagrimale? *Il monimento med. chir.*, vol. xiv, fasc. 1. In severe cases of dilatation of the lachrymal sac, in which total extirpation had been advised, Sbordone considers the excision of the anterior wall sufficient to produce the same effect. DANTONE.

171. BULL. Syphilitic diseases of the lachrymal apparatus. *N. Y. Med. Journ.*, April, 1882. B. treats in this paper, 1st, of the syphilitic lesions of the lachrymal gland. He states that the gland appears to be free from gummous infiltration, and, in fact, any form of syphilitic disease of the gland is rare. 2d. Syphilitic lesions of the lachrymal caruncles. 3d. Syphilitic lesions of the canaliculi, sac, and duct. BURNETT.

IV.—MUSCLES AND NERVES.

172. THEOBALD. What constitutes insufficiency of the internal recti muscles? *Amer. Jour. Med. Sci.*, April, 1882. T. has found a degree of insufficiency, ascertained by means of the vertical diplopia test, in a large number of eyes where there was no complaint of asthenopia. He is at a loss to know where to draw the line between normal and pathological insufficiency. He therefore concludes that a very considerable divergence (even of 22° for the vertical line and dot test of Gräfe) does not of necessity indicate a pathological insufficiency of the int. recti. BURNETT.

173. HARLAN. Case of intermittent concomitant convergent strabismus. In a healthy boy, three years old, the strabismus has been of a tertian type for a year. Later the attacks became irregular, appeared at greater intervals, and now, three years after the affection began, they are very rare. These ARCH., vol. x, No. 3.

174. STELWAG. Papers on practical ophthalmology. Complement to the text-book. Vienna, 1882, No. 7. Genuine convergent strabismus must be explained as an excess of convergence, which latter naturally is coördinate to the accommodation, practised to reduce the great strain upon the accommodation and gradually become a habit; this excess of convergence is voluntary, though not practised from choice. The result of the squint-operation, in many cases so brilliant, is really not a true cure, but a masking of the affection.

175. TESSUT. Recherches sur le mode de cicatrisation du tendon après la strabotomie, *Rec. d' ophth.*, Feb., 1882. After the tenotomy of a muscle the end of the tendon again attaches itself to the sclera by means of fibrous bands, more seldom to the conjunctiva. Care should be taken in dividing the tendon of the internal rectus, as the muscle withdraws to a considerable degree.

176. BOUCHERON. De la cure du strabisme convergent intermittent par les mydryatiques ou les myotiques. *Arch. d' ophth.*, vol. ii, 1. Atropine treatment is useful in beginning of periodic convergent hypermetropic squint, as it paralyzes the accommodation and thus prevents the tendency toward ex-

cessive convergence. The atropine cannot be dispensed with, until not even a momentary strabismus is apparent when looking at an object held close. Glasses completely correcting the hypermetropia should then be worn. Eserine may be given at the end of the atropine treatment and in those rare cases in which convergence increases under mydriatics.

177. MORANO. Contribuzione alla patogenesi dello strabismo ottico. *Giorn. delle malatt. degli occhi*, vol. v, Feb., 1882. Convergent squint in a child 20 days old; five days previously a violent catarrh of the lachrymal ducts and the conjunctiva had sent in. The squint did not disappear until two months after the inflammation had ceased. The author thinks that an inflammation of Tenon's capsule was the cause. DANTONE.

178. BERRY. Clinical notes and remarks on two unusual forms of strabismus. *Ophth. Rev.*, vol. i, No. 3, Jan., 1882, p. 46. In the first case patient, æt. 41, had complained of occasional diplopia for five weeks previously. This had latterly become persistent. Refraction emmetropic. V normal. Convergence of optic axis for ∞, homogeneous diplopia. Diplopia and relatively too great convergence up to within 2 feet. Left eye used for fixation. Pupils small and inactive. Patient had been in a very depressed state on account of domestic troubles. Berry looks upon this case as one of spasm of convergence, probably brought about by some temporary irritation of the centre of convergence. The second case was a man, æt 22, who complained of dimness in the sight of the left eye, which had come on two weeks ago. He had divergence for ∞ — 3‴, and generally used the right eye for fixation, whose vision was normal. Pupils motionless. No divergence for near vision. FITZGERALD.

179. THAN. Des rétractions consécutives aux paralysies oculaires et de leur traitement chirurgical. *Rec. d' ophth.*, 1882, No. 3. Paralysis of the muscles of the eye may be treated in three ways: by medicamentation, by prisms, and by an operation. If the paralysis does not disappear after some length of time under medicines, prisms may be used as a palliative if the deviation is but slight. In the rest of the cases the operative method should be resorted to. In low degrees the antagonist of the paralyzed muscle is divided; in higher degrees the paralyzed muscle is advanced besides.

180. RANKIN. Spasmodic neuralgia. *Med. Rec.*, 1882, No. 9.

181. UNTERHARNSCHEIDT. On incomplete paralysis of the occulomotor nerve and accommodative astigmatism of the lens. *Leh. Monatsbl.*, vol. xx, p. 37. In a chlorotic girl of 11, paresis of accommodation developed after a severe attack of gastralgia. The right pupil was wider than the left. Besides this there was crossed diplopia. This condition was explained by the curvature of the lens which had developed unequally. The diplopia disappeared after using iron, but the accommodative astigmatism of the lens persisted for some time.

182. LICHTHEIM. On nuclear paralysis of the muscles of the eye. *Corr.-Bl. f. Schweizer Aerzte*, 1882, Nos. 1 and 2. In a formerly healthy girl of 21 paralytic ptosis and exophthalmus developed in both eyes, in the left more marked than in the right. All the muscles of the right eye were affected, except the ext. rect. and sup. obl. All the muscles of the left eye were paralyzed. Both pupils showed normal reaction, the accommodation also. The

author thinks that the affection was due to a lesion of both nuclei of the oculo-motor and of the left trochlearis and abducens nerves.

183. WARNER. Atrophy of the muscles supplied by the fifth cranial nerve, with atrophy of the orbital fat on the same side; remarks. *The Lancet*, Jan., 1882, p. 13.

184. ARMAIGNAC (*Rev. d' ocul. du sud-ouest*, vol. iii, 3, p. 53) reports a case of paralysis of the superior rectus in a woman of 27, which had developed after typhoid fever in her fifth year. He also observed a congenital paralysis of the left superior rectus in a child 2 years old.

185. COPPEZ. Nevralgie, datante de vingt ans, guérie par l' élongation du nerf sous-orbitaire. *Ann. d' ocul.*, Jan., Feb., 1882, p. 59. A miner of 51 had suffered from neuralgia of the right side of the face for 20 years, which had resisted all remedies. It was cured by stretching the infra-orbital nerve.

186. LETULLE. Sur un cas de zona ophthalmique compliqué de paralysie faciale. *Arch. de physiol.*, vol. i, p. 162. He reports a case of herpes zoster ophthalmicus which was accompanied by paralysis of the facial nerve.

V.—ORBIT AND NEIGHBORING CAVITIES.

187. IMRE. A rare case of osteoma of the orbit. *Centralbl. f. A.*, 1882, p. 41. The author saw an osteoma of the orbit in a woman 62 years old, 8½ *cm.* long, 6½ *cm.* thick, and 6 *cm.* high. It was said to have existed for 42 years, and had so displaced the eye that the cornea was on a level with the corner of the mouth. The tumor was cast off spontaneously after an inflammation which lasted a year. Healing was good and the eye almost regained its original position.

188. TEILLAIS. De quelques tumeurs de la région orbitaire. *Ann. d' ocul.*, Jan.-Feb., 1882, p. 44. In a man of 32 a cyst developed from the frontal sinus, which dislocated the left eye downward. After its removal the eye again resumed its normal position; nothing remained but a scar in the supra-orbital region. In a young man of 19 an ivory tumor sprang from the frontal sinus, which dislocated the eye downward. As the tumor had a broad base, it could only be partially removed.

189. DOR. Kyste congénital de l' orbite, microphthalmie, colobome de l' iris et de la choroide. *Rev. génér. d' ophthalm.*, 1882, No. 2, p. 81. Dor describes a congenital cyst of the orbit, which was complicated with microphthalmus; the eye had a coloboma of the iris and choroid.

190. DUFAIL. Des sarcomes de l' orbite et de leur traitement par l' extirpation des parties molles. *Thèse de Paris*, 1882. In sarcomas of the orbit Dufail advises exenteration.

191. PORTER. Reticulated round-cell sarcoma of the orbit with secondary growth internally, containing melanotic deposits. *N. Y. Med. Rec.*, Jan., 1882, p. 104.

192. ROSMINI. Un caso di esoftalmo da tumore sanguigno cavernoso retro-bulbare trattato coll' elettrolisi. *Ann. d' ottalm.*, vol. x, 6, 1882. Case of a girl of 16, in whose left eye the tumor had existed since her third year; it had grown considerably the first month after menstruation had begun. Electrolysis

(by inserting a steel and platinum needle) was resorted to three times at intervals of two weeks, fifteen minutes each time, and was followed by rather severe general symptoms. The shrinkage was considerable, so that the globe, otherwise normal, again became freely movable. DANTONE.

193. BERGER. Aneurisme artérioso-veineux de l' orbite. *Bull. et mém. de la soc. de chir. de Paris*, vol. vii, 11.

194. DE CAPDEVILLE. Tumeur de l' orbite. Extirpation. Guérison. *Marseille méd.*, 1882, No. 1. In a woman of 44 a high degree of exophthalmus had existed for 15 years, unaccompanied by any reduction of mobility, either of the globe or the upper lid, but by visual disturbances. It was caused by a cavernous angioma, which had developed in the posterior part of the cone of muscles, and was excised with great loss of blood. After ten days it had healed with considerable improvement in vision. V. MITTELSTÄDT.

195. PEYROT. Angiome fibreux de l' orbite. *Gaz. hebd. de méd. et de chir.*, 1882, No. 7, p. 113.

196. HOTZ. Fatal tetanus caused by a piece of wood in the orbit. *Chicago Med. Rev.*, vol. v, 1, p. 14. Hotz reports a case of injury, in which a piece of wood 2" long and $\frac{3}{4}$" wide entered the orbit. It caused tetanus with fatal termination.

197. NOYES. A case of pulsating exophthalmus. *Trans. Amer. Ophth. Soc.*, 1881. In a girl of 8 the tumor developed four years ago after a febrile disease. Pressure upon the carotid caused the pulsation but not the exophthalmus to disappear. The art. angularis was ligated and a series of ligatures then applied around a distended blood-vessel down into the spheno-maxillary fissure. Noyes thought that it was the anterior orbital vein, which, coming from the spheno-maxillary fissure, empties into the cavernose sinus. The wound healed, and six weeks later the exophthalmus had disappeared.

198. EALES. *Birmingham Med. Rev.*, Jan. 4, 1882, p. 46. Pulsating exophthalmus, with paralysis of 3d, 4th, 5th, 6th, and 7th nerves, and blindness from absolute glaucoma, following severe crush of the head. Probably fracture of petrous bone and rupture of internal carotid. E. NETTLESHIP.

199. SCHNAUBERT. Case of morbus Basedowii. *Klin. Wochenschr.*, No. 13, p. 201. Milk diet; considerable improvement; relapse; death. HIRSCHMANN.

200. HOCK. Orbit. Eulenberg's *Real-Encyclopädie d. ges. Heilk.*, vol. x, p. 193–207.

VI.—CONJUNCTIVA, CORNEA, SCLEROTIC.

201. HAUSSMANN. Blennorrhœa neonatorum. Stuttgart, F. Enke, 1882, 175 pages. Most cases of blennorrhœa neonatorum are due to infection with the vaginal secretion of the mother, though the lochia or the sero-purulent secretion of a sore nipple or inflamed breast may also be the cause. It may also be produced by pus from a sore upon the child, or by foreign animal tissue, especially pieces of the placenta placed upon the eyes. One eye may also infect the other, or it may be conveyed upon the eye by the substances used in oiling the finger or for local application. In order to prevent the infection

every women should be cautioned to check while yet pregnant any discharge of the genital organs. If an increased secretion is not noticed until the beginning or during the course of the birth, a moderate mucous secretion may be stopped so completely by prophylactic irrigation and careful disinfection of the vulva in case of a moderately long birth-act of a multipara, that it is sufficient to disinfect the eylids after the head is born in order to prevent infection. If there is a profuse purulent, or thin serous discharge, however, the genital organs must be frequently cleansed. The lids and their surroundings should be carefully disinfected after the birth of the head, and before they are first opened, in order to prevent any infectious substances from reaching the conjunctiva. If it was impossible to amply these prophylactic measures before the eyes were opened, a 2% solution of nitrate of silver should be dropped into the conjunctival sac. After the birth of the child great care should be exercised that the lochia or the secretion of a sore nipple does not come in contact with the eye. In lying-in hospitals and foundling asylums the strictest disinfection should be practised, and the children with healthy eyes should be kept apart from those with sore eyes.

202. STELLWAG. The treatment of ophthalmo-blennorrhœa. *Allg. Wien. med. Zeitung*, No. 15–18. In the beginning of blennorrhœa Stellwag prescribes cold applications, frequently changed; bleeding is unnecessary, as well as scarification and canthoplasty. Internal remedies are of no use. When the inflammation has reached its height, the lids should be touched once or twice daily with a 2–3% solution of nitrate of silver. The eye is washed out every 3–4 hours with a 3% solution of permanganate of potassa.

203. LANGE. Iodoform in blennorrhœa neonatorum. *St. Petersburger med. Wochenschr.*, No. 10, p. 82. In 6 cases of blennorrhœa neonatorum (11 eyes) Lange dusted iodoform into the eye. After this had been done for 3 days, 3–4 times daily, granulations developed with small epithelial defects and opacities of the cornea. The eyes did not become better until the caustic treatment had been again adopted.

204. SCHIRMER. Blennorrhœa neonatorum. *Centralbl. f. Gynäcologie*, No. 14.

205. MÜLLER, FRANZ. Statistics of blennorrhœa neonatorum from the ophthalmic clinic of Greifswald University. *Inaug.-Dissert.*, 1882.

206. ABADIE. Traitement de la conjonctivite blennorrhagique. *Gaz. des hôp.*, 1882, No. 42. The author recommends a 3–4% solution of nitrate of silver, which should be applied as soon as possible and repeated every 12 hours, no matter whether or not the eschara has been cast off. The same treatment is still more urgently advised when the cornea is affected. V. MITTELSTÄDT.

207. PERRIN. Sur une forme de conjonctivite purulente rhumatismale. *Progr. méd.*, 1882, No. 47.

208. TWEEDY, J. The treatment of diphtheritic conjunctivitis by quinine solution. *The Lancet*, 1882, No. 1. Tweedy uses a 1% solution of quinine in diphtheritic conjunctivitis and has never seen any serious corneal damage.

NETTLESHIP.

209. TERSAN. Traitement de l'ophthalmie purulente. *Bull. de thérap.*, fasc. ix, p. 431. Tersan advises to cauterize with nitrate of silver 1:20, then

1:50, besides scarification and cold compresses with a 5% solution of carbolic acid.

210. BROUCHET. Note sur le traitement chirurgical de l' ophthalmie granuleuse. *Rec. d' ophth.*, 1882, No. 2, p. 68. Brouchet recommends the method which Galezowski has practised for 10 years in trachoma. He excises with a pair of scissors the whole cul-de-sac which is affected both above and below. He reports favorable (! ?) results.

211. HOCK. A case of ulceration of the conjunctiva. *Wiener med. Blätter*, 1882, No. 7. In a young man of 15, a ragged ulcer with a soft fundus covered with small nodules was found upon the conjunctiva of the upper lid. The lymphatic glands were swollen. No signs of syphilis.

212. WICHERKIEWICZ. Some reflections on so-called warts of the globe. *C. f. A.*, 1882, p. 13. Wicherkiewicz observed close to the sclero-corneal margin a clearly bounded, round, smooth, grayish-yellow, hard tumor, with two bristly hairs, which somewhat overlapped the conjunctiva ; it was not movable upon the sclerotic, and the conjunctiva firmly adhered to it. It was 4 *mm.* broad and 2-3 *mm.* thick. After removal it was examined, and found to consist of connective tissue with interspersed elastic fibres. The tumor sprang from the sclera, and had developed within 4 weeks.

213. PFLÜGER. Verrucæ conjunctivæ. *Annual Report of the Clinic of Berne University for* 1880., Berne, 1882, No. 17. Pflüger saw on the limbus conjunctivæ and the inner side of the upper lid 6–7 roundish tumors, 4-6 *mm.* in diameter and 0.5–1 *mm.* high. Each nodule was surrounded by a number of smaller ones. They were removed, but grew again.

214. PFLÜGER. Peculiar affection of the conjunctiva of the globe, with hemorrhages, neoplastic tissue, and superficial ulceration. *Ibid.*, p. 20. It was observed in a seamstress of 19. She was highly anæmic, her skin grayish-yellow, and there were pharyngitis and ozæna. The proliferating portions of the conjunctiva were removed together with the ulcerations. The course of healing was good. The microscopic examination showed the excised portions to consist of granulation tissue.

215. PFLÜGER. Epithelioma of the conjunctiva of the globe. *Ibid.*, p. 25. A man of 56 had a nodular excrescence upon the left eye, which extended from the centre of the cornea as far as the caruncle, and was firmly attached to the globe. The eye was enucleated. The tumor proved to be a cancer.

216. RÄHLMANN. On hyaline and amyloid degeneration of the conjunctiva of the globe. *Virchow's Arch.*, vol. lxxxvii, p. 325.

217. RÜBEL. The scrofulous affections of the conjunctiva and cornea, and their relation to the so-called scrofulous diathesis. *Centralbl. f. prakt. Augenheilk.*, 1882, p. 75. After compiling the cases of scrofulous affections of the conjunctiva and cornea treated in Hirschberg's clinic, the author comes to the conclusion that they are more frequently found combined with other visible symptoms of scrofula, as swelling of the glands, rhinitis, eczema, etc., than the non-scrofulous affections.

218. HORNER. Essential shrivelling of the conjunctiva. *Corr.-Bl. f. Schweizer Aerzte*, 1882, No. 1, p. 12. The disease is very rare ; among 70,000

patients it was observed only 3 times. The prognosis is bad, even after operative trèatment. Horner transplanted human conjunctiva, which checked the progress of the disease.

219. AMÉDÉE ROBIN. De la kératite marginale phlycténulaire. *Thése de Paris*, 1882.

220. DUJARDIN. Kératite infantile, injection hypodermique d' alcohol. *Bull. de thérap.*, 1882, No. 1, p. 26.

221. LEWKOWITSCH. Two cases of interstitial keratitis. *Zehender's Monatsbl.*, vol. xx, p. 12. In a case of gastritis, Lewkowitsch observed the occurrence of interstitial keratitis, which grew better or worse, according to the state of the former. Iodide of potash cured the whole affection. In another case, interstitial keratitis set in. Here a quotidian intermittent fever was followed by a chronic gastric catarrh.

222. PFLÜGER. Specific parenchymatous keratitis. *Ophthalmic Clinic of Berne University.* Rep. for 1880, Berne, 1882, p. 31. As soon as the most severe symptoms of irritation have disappeared, the author advises in specific parenchymatous keratitis the use of a vaseline-salve (0.5%) of the yellow oxide of mercury, gradually increasing its strength to 3%.

223. COLSMANN. Case of recurrent affection of the cornea in gonorrhoic arthritis. *Berl. klin. Wochenschr.*, No. 16. Colsmann observed in a gentleman who was troubled several times with affections of the joints after gonorrhœa, the appearance of recurrent keratitis.

224. CHEATHAM, W. Inoculation for pannus, with a case. *Amer. Practitioner*, Feb., 1882. The inoculation was made of pure gonorrhœal matter. Before treatment there was but little more than perception of light ; after the inflammation had subsided V = $\frac{10}{200}$. BURNETT.

225. ARMAIGNAC. Quelques considérations sur l' étiologie et le traitement de l' ulcère serpigineux de la cornée. Observation. *Rev. d' ocul. du sud-ouest*, vol. iii, p. 1.

226. ABADIE. Des ulcères infectieux de la cornée et de leur traitement. *Ann. d' ocul.*, March–April, 1882, p. 143. The serpent ulcer of the cornea is doubtless of an infectious character. It is caused by the entrance of micro-organisms into an eroded portion of the cornea. It is best treated by splitting it according to Sämisch, as compression and mortification of the corneal tissue, which gradually spreads, can be prevented by removing the exudation. Then eserine should be instilled and a light compressive bandage applied.

227. ARMAIGNAC. Erosion superficielle traumatique de la cornée chez un individu atteint de dacryocystite chronique. *Rev. d' ocul. du sud-ouest*, vol. ii, p. 6. The cornea of an individual suffering from chronic dacryocystitis was abraded, whereupon a serpent ulcer with hypopyon developed. Antiseptic treatment failed entirely ; but recovery was rapid as soon as the ulcer was cauterized.

228. PFLÜGER. Traumatic herpes of the cornea. *Conf. f. c.*, p. 28. What Pflüger understands by traumatic herpes of the cornea is an eruption of vesicles upon the cornea of elderly people. It has the appearance of ordinary herpes vesicles. All the patients had previously been operated. Pflüger therefore thinks that the irritation due to the operation is a factor contributing to the development of the disease. The affection lasts from four to fourteen days.

229. MANDELSTAMM. Case of fistula of the cornea. *Centralblat. f. prakt. Augenheilk.*, 1882, p. 12. A lady of 25 had a central corneal fistula, in which lay a piece of iris. Mandelstamm made an incision at the corneal margin and removed the iris from the fistula. In a short time the anterior chamber was restored and the fistula had closed. A central corneal spot remained.

230. MAYERHAUSEN. The removal of foreign bodies from the cornea. *Centralbl. f. prakt. A.*, 1882, p. 48. Mayerhausen removed a foreign body 1.5 *mm.* long, which was completely embedded between the posterior layers of the cornea and had pierced Descemet's membrane, by enlarging the path of entry, inserting a cystitome under the foreign body, and thus extracted it.

231. HOBBY, C. M. Operative procedures in corneal lesions. *Trans. Iowa State Med. Soc.*, 1882, No. 2. A recommendation of iridectomy for bullous keratitis and synechiæ where the cornea is involved, and of peritomy and Sämisch's operation. BURNETT.

232. BELLOUARD. Kératite professionelle. Incrustations plombiques de la cornée. *Arch. d ophth.*, 1882, vol. ii, No. 1. Bellouard observed a fresh incrustation of the cornea with lead in two workmen engaged in the manufacture of acetate of lead, which was followed by severe inflammatory symptoms. In the one case phlyctenular keratitis, in the other a slight injury led to a partial loss of epithelium. In this way impregnation with the finely divided particles of the salt floating about was possible. v. MITTELSTÄDT.

233. KROLL. Contributions to the knowledge of neuro-paralytic keratitis. *Centralbl. f. prakt. Augenheilk.*, 1882, p. 72. Kroll observed in a woman left-sided herpes zoster, conjunctivitis, and opacity of the cornea. The perception of heat and cold was preserved in the affected parts, but perception of pressure and pain lost. There were also paresis of the abducens and considerable dilatation of the pupil. An ulcer developed upon the cornea, making necrosis probable. Iodoform dusted into the eye, combined with a bandage, gradually brought about recovery.

234. LITTLE, W. S. Kerato-malacia. *Phila. Med. Times*, April 22, 1882. The corneal sloughing in this case was symptomatic of brain-lesion with a neuro-paralytic condition of the fifth nerve. BURNETT.

235. BÖCKMANN, E. The nature and causes of the corneal affection accompanying anæsthesia of the trigeminus. Bergen, 1882, 163 pages. The author subdivides his treatise into two sections, an experimental and a clinical one. After viewing the most important contributions of others on this subject, he reports the results which he arrived at after about 100 experiments upon cats. In all essential points they agree with the investigations of Feuer, according to whom the corneal affection developing after intracranial division of the trigeminus must be explained as a xerosis of the cornea and a xerotic keratitis resulting from it. The author lays especial stress upon the importance of repeated and accurate tests of the sensibility of the eye and its adnexa, as in this way only it can be ascertained whether or not the trigeminus has been completely divided. In the clinical part Böckmann describes a xerosis of the cornea and xerotic keratitis which frequently occur among lepers. As these processes, according to the author, are synonymous with so-called neuro-paralytic keratitis, he believes, in opposition to Bull and Hansen, that the latter disease is not rare among lepers. BULL.

236. BLANCH. Périsclérite rhumatismale. *Rec d' opth.*, 1882, Nos. 2 and 3. Blanch reports a case of rheumatic periscleritis. It was cured in 6 days, by alternate instillations of atropine and eserine and internal treatment with quinine. MARCKWORT.

237. H. R. Massage oculaire. *Annal. de la soc. méd.-chir. de Liège*, March, 1882. The author discusses massage of the eye according to Pagenstecher's method, and recommends this method of treatment, especially in mild cases of phlyctenular conjunctivitis and in subconjunctival hemorrhage, which disappears more rapidly when thus treated; it is also useful in hypopyon and hyphæma. MARCKWORT.

C.—IRIS AND UVEAL TRACT, GLAUCOMA, SYMPATHETIC OPHTHALMIA, REFRACTIVE MEDIA (LENS AND VITREOUS BODY), RETINA AND FUNCTIONAL DISTURBANCES, OPTIC NERVE, INJURIES, FOREIGN BODIES (PARASITES), OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

By Dr. A. NIEDEN.

I.—IRIS AND UVEAL TRACT.

238. ALIA. De l' iritis séreuse et des phénomènes glaucomateux. *Thèse de Paris*, 1882.

239. BENSON. On coloboma of the choroid and the optic nerve sheath. *Dublin Journ. of Med. Sci.*, March, 1882, pp. 177–185.

240. COOMES, MARTIN F. Osseous degeneration of the eye. *Med. Herald*, March, 1882. The degeneration was the result of an inflammation of the uveal tract, occurring during childhood. The hyaloid and choroid were transformed into a bony shell, with an opening corresponding to the optic nerve entrance, with a diameter of $\frac{1}{10}$ of an inch. The anterior portion had points of chalk deposit. BURNETT.

241. DANESI. La sclero-coroidite. *Boll. d' ocul.*, No. 5, Gennaio.

242. DANESI. Un caso di sclero-coroidite anteriore con stafiloma terminato assai felicimente. *Boll. d' ocul.*, vol. iv, 8, p. 93.

243. FANO. Sur l' influence que la choroide exerce sur l' acuité de la vision. *Gaz. méd. de Paris*, No. 52. *Compt. rend. des sci.*, No. 23.

244. GOLDZIEHER. On disseminated choroiditis. *Wien. med. Bl.*, No. 10, p. 302, and *Pesth. med. chir. Presse.* Meeting of March 4. The author thinks that the genetic and anatomical relation between disseminated choroiditis and retinitis pigmentosa is closer than has heretofore been supposed to be the case, the latter affection being nothing else than a form of chronic plastic choroiditis. The pigment in retinitis pigmentosa originates in the choroid. See below, under vitreous body, No. 272.

245. V. HASNER. Case of primary sarcoma of the iris. *Prag. med. Wochenschr.*, No. 6, p. 58, 1882. The left eye, which was the affected one, had been injured 15 years ago, and after that slightly several times. The tumor had slowly developed in the upper-outer quadrant of the iris; its base extended from the periphery of the iris to the edge of the pupil. V—$\frac{1}{3}$. This reduction of the power of vision was probably due to secondary hyperæmia of the choroid and retina. Among 32 cases of sarcoma of the uveal tract, 2 cases only were confined to the iris.

246. KIPP, J. C. Two cases of sarcoma of the choroid presenting unusual clinical features. *Trans. Amer. Ophth. Soc.*, 1881. In both cases the tumor had grown to a considerable size without producing an increase of tension or total detachment of the retina. With the exception of these symptoms, both cases agree with the description of detachment of the choroid given in the text-books. BURNETT.

247. NETTLESHIP. Chorio-retinitis in inherited syphilis. Ophth. Soc. of Great Britain. *The Lancet*, No. 12.

248. RÉNÉ. Granulomes et gommes de l' iris. *Gaz. des hôp.*, No. 60, p. 500. Observed in 2 children with hereditary syphilis.

249. UHTHOFF. Congenital anomalies of the uveal tract. Statistics and cases. *Ann. Rep. of Schöler's Ophthalmic Clinic* for 1881, p. 7. Peters, 1882. Case of fatal irido-choroiditis, with posterior circular synechiæ and extensive choroidal changes. *L. c.*, p. 13.

250. WOLFE, JR. Case of tubercle of the iris and ciliary body. *Brit. Med. Jour.*, March 4, 1882, p. 299. In a clinical lecture, Dr. Wolfe, of Glasgow, draws attention to an interesting case of tubercle of the iris and ciliary body, which occurred in an eye which had been injured a month previously by a blow. The microscopic examination was made by Professor Hirschberg and Dr. F. Krause. Eight months later patient returned with ulceration of both legs and induration at the margin of both tibiæ. FITZGERALD.

II.—GLAUCOMA.

251. AGNEW, C. R, and WEBSTER, D. Report of some cases of glaucoma in which an iridectomy on one eye seemed to precipitate an attack of acute glaucoma of the other. *Med. News*, vol. xi, No. 8, Feb. 25th, No. 476.

252. HEYL, ALBERT G. Acute glaucoma caused by duboisia. *Amer. Jour. Med. Sci.*, April, 1882. The patient, a woman of 55 years, was already suffering from a simple glaucoma. A $\frac{2}{3}$ per cent. solution of duboisia was instilled for dilatation of the pupil for ophthalmoscopic examination. Subacute inflammatory glaucoma developed in the course of a few hours, for which an iridectomy was done with a happy result. BURNETT.

253. MAUTHNER. The excavations of the optic nerve. *Wien. med. Bl.*, No. 10, p. 300. In this paper the author declares in favor of the theory that glaucoma is a form of serous choroiditis. It is this and not the increased intra-ocular pressure which destroys sight, those cases being known to be the worst in which T — n. Choroiditis is the primary affection, the increased pressure only a secondary symptom.

254. PRIESTLEY SMITH. The action of atropine and eserine in glaucoma. *Ophth. Rev.*, vol. i, Nos. 4 and 5, Feb. and Mar., 1882, pp. 75 and 113. The author's object is to point out, as far as may be, on the evidence of pathological and clinical observation, what are the particular changes which atropine and eserine are competent to effect in the glaucomatous eye, and what are the indications for their employment and avoidance. These drugs exert very little influence on the tension of the healthy eye, therefore their marked action in glaucoma must be due to abnormality in the glaucomatous eye. This, S. believes, lies in the mechanical relations of the iris, and he thinks it can be shown that whenever a myotic or mydriatic raises or lowers the tension of the eye in any very marked degree, it does so by altering the position of the iris in such a manner as to hinder or promote the escape of the intra-ocular fluid. At the conclusion of the paper he sums up the rules concerning the use of eserine and atropine in glaucoma. FITZGERALD.

255. RHEINDORF. Case of glaucoma with acute opacity of the lens. *Zeh. klin. Monatsbl.*, vol. xx, 1882, p. 15. In a man with incipient senile cataract acute glaucoma of the left eye developed, which was followed at once by opacity of the lens. The author endeavors to assign the same cause to both affections. The more the zonula is stretched by the increased intra-ocular tension the less permeable it becomes. Thus the nutrition of the lens suffers, the consequence of which must be the rapid development of cataract.

256. WAGNER. Statistics of glaucoma (*Min. of the meetings of the med. soc. of Odessa*, 1881, No. 17). Confirms the observations of Benedict, Rosa, Arlt, Ridel, Schmidt, and Kranhals of the more frequent occurrence of glaucoma among the Jews, and seeks to explain it as a hereditary peculiarity of the race. HIRSCHMANN.

257. WATSON, SPENCER. Case of eyeball tension. *Brit. Med. Jour.* Mar. 11, 1882, p. 344. Mr. Spencer Watson reported a successful case of sclerotomy at the Clinical Society of London. O. D. operated on five years ago. O. S. operated on last year. Result not so good, but tolerably so. W. finds eserine very useful both before and after operation. Slight contraction of palmar fascia which W. had noticed in other glaucomatous cases, and was inclined to think that concurrence of the two conditions may possibly throw light on the pathology of glaucoma. He supposes that an atrophic hardening of the sclerotic coat of the same kind as the shrinking of the palmar fascia may be the initial stage of the disorder. FITZGERALD.

258. DE WECKER. La cicatrice à filtration. *Ann. d' ocul.*, Mar.–Apr. Wecker defends sclerotomy and attacks Schöler, who asserts, basing his opinion on his experiments on animals, that there is no such thing as a filtration scar. Schöler's experiments were made on healthy, not upon glaucomatous eyes; therefore the formation and effect of the scar in Schöler's experiments were essentially different from that forming after sclerotomy. Wecker proposes instead of the appellation Fontana's canal, rigole (gutter) of Fontana. *Vide Trans. Internat. Med. Congr.*, vol. viii, p. 100, and rep. in *Arch. f. Augenheilk.*, vol. xi, No. 1, p. 91. MARCKWORT.

259. WILLIAMS, C. A contribution as to the efficacy of eserine in glaucoma and analogous affections. *N. Y. Med. Record*, Mch. 25, 1882. W. reports three cases in which the use of eserine was a determining and essential

factor in the relief of glaucomatous symptoms. Case 1. Iritis plastica; glaucoma consecutivum. 2. Injury with hæmophthalmus, dislocation of lens into vitreous, consecutive glaucoma. 3. Acute glaucoma in myopic eye. He has also observed a reduction of an abnormal tension in an eye suffering from congenital irideremia by means of eserine. BURNETT.

III.—SYMPATHETIC OPHTHALMIA.

260. BRIÈRE (Havre). Cataracte sénile, compliquée de synéchie totale et d' iritis sympathique. *Gaz. des hôp.*, Jan. 28, 1882. In a man of 56 there was closure of the pupil in the right eye after an unsuccessful cataract-extraction; in the left, senile cataract, with total posterior synechiæ; in both eyes cyclitis was shown to exist at corresponding points. Brière then performed an iridectomy upon the right eye, in order to see if this repeated operation would react unfavorable upon the other eye (!). Sympathetic ophthalmia set in, making the enucleation of the right eye necessary. Twice an iridectomy was performed upon the eye sympathetically affected, and the cataract extracted with a hook. There is no accurate report of the man's vision, it being only stated that he can neither read nor write. MARCKWORT.

IV.—LENS.

261. CRITCHETT. Practical remarks on cataract. *Ophth. Rev.*, vol. i, No. 4, Feb., 1882, p. 73, continued from p. 26. As regards an operation, the author advises not to operate upon the one until there is a marked diminution of sight in the other. But if symptoms of general constitutional degeneration are observed, it is advisable not to postpone the operation if the cataract is ripe, even though sight in the other eye may still be good, so that the chances of success later may not become worse, and safety be insured to the patients.

262. GALEZOWSKI. De l' influences des irites et des choroidites sur le développement des cataractes. *Rec. d' ophth.*, Feb., 1882. The lens is nourished from the aqueous humor. If disease of the uveal tract affects the latter, the nutrition of the lens suffers. Galezowski discusses the cataracts which result from this; he calls them "choroiditic cataracts," and subdivides them into four classes: Choroiditic cataracts, more strictly speaking glaucomatous cataracts; cataracts resulting from detachment of the retina; and cataracts from retinitis pigmentosa, as the latter disease is only due to choroidal changes.

263. HARLAN, G. C. Two cases of congenital irideremia, with lamellar cataract in one and dislocated cataractous lenses in the other. *Boston Med. & Surg. Journ.*, April 20, 1882. BURNETT.

264. KNAPP, H. On the extraction of cataract. Clinical remarks made before the class of students at the N. Y. Ophth. and Aur. Inst. *N. Y. Med. Rec.*, Feb. 18, 1882. A synopsis of 30 successive extractions, with remarks on the operation in general. From this we learn that the operator has gradually abandoned the strictly linear incision of Graefe and now uses the small flap section of Wecker, with a large iridectomy. This latter, with special care as to the corners of the wound, Knapp thinks most important. He practised peripheral capsulotomy exclusively, different modifications of which are described,

and used antiseptic measures in every alternate case for the sake of testing its value. There was no failure in these 30 cases. For details as to his methods of operating see his various papers published in these ARCHIVES. BURNETT.

265. NOYES, H. D. The so-called cure of cataract by electricity. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. In a woman of 70, Noyes found incipient cataract, with slight changes in the choroid. V—$\frac{20}{70}$ and $\frac{20}{200}$. Twenty months later, during which she had ostensibly been cured by electricity, he examined her again and found extensive atrophy of the choroid. V—$\frac{20}{100}$ and $\frac{20}{200}$. It was evidently a case of subacute choroiditis, with peripheric opacity of the lens and slight opacities of the vitreous, which had disappeared under electric treatment and proper hygienic measures. BURNETT.

266. REYNOLDS, DUDLEY S. Cataract-extraction. *Med. Herald*, Feb., 1882. Reynolds reports 222 extractions, with a loss of 4 eyes. He employs a wide corneo-scleral section, a broad iridectomy, and a peripheral capsulotomy. This latter he reports as having recommended in 1876. BURNETT.

267. ROOSA, ST. JOHN. Cataract. The following cases occurred at the service of Dr. Roosa at the Manhattan Eye and Ear Hospital:

1. Senile cataract—inflammatory deposit in the pupil—corneal section-anæsthetics. Dr. R. does not open the eyes early after the operations.

2. Senile cataract—escape of the lens in its capsule—the flannel bandage. He regards the exclusion of all light from the room of patients operated on for cataract as not only useless but detrimental.

3. Senile cataract—delayed union of the corneal flap—secondary operation—failure.

4. Congenital cataract—good perception of light—needling—ability to recognize objects. The patient was 11 years old. He required to be taught how to see. He is learning the colors, and now recognizes black, white, blue, and red. It will be noted as an important fact that the colors which he first recognizes as distinct impressions are at the extremes of the spectrum.

5. Traumatic cataract—closed pupil—inflammation of the vitreous—Loring's method of iridectomy—restoration of vision. BURNETT.

268. THEOBALD, SAMUEL. Report of a case in which useful vision was maintained through a number of years by the aid of a totally dislocated lens. *Trans, Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. The dislocation was probaby congenital. The examination showed that the focal distance of the dislocated lens not only was much smaller than that of the relaxed lens in the diagrammatic eye, but even less than that of the accommodating lens. It can hardly be assumed that the power of this lens was equivalent to that of a normal lens just detached from the ciliary muscle. But the great convexity which it showed is of importance, and seems to be a further proof of the theory of Helmholtz in regard to accommodation.

269. UHTHOFF. Congenital affections of the lens. *Annual Report of Schöler's Ophthalmic Clinic* for 1881. Peters, Berlin, 1882. Cases and statistics, p. 7. Case of unilateral congenital (?) zonular cataract, p. 16.

270. ZEHENDER. Case of unilateral congenital zonular cataract. No defects of the bone. *Zeh. Monatsbl. f. klin. Augenheilk.*, vol. xx, p. 53.

V.—VITREOUS BODY.

271. GALEZOWSKI. Persistance des vaisseaux hyaloidiens. *Rec. d' ophth.*, March, 1882. Description of two cases of persistent hyaloid artery and vein, and one of persistent Cloquet's canal. In the former two cases there was posterior polar cataract. In the case of persistent Cloquet's canal a thread-like formation extended from a posterior polar cataract into the vitreous, widening gradually to such an extent as to cover the whole disc, forming a conical membrane with its base upon the disc and its apex at the posterior polar cataract.

MARCKWORT.

272. LITTLE, W. S. Remarks on persistent hyaloid artery. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. Two cases were observed. In the second case only the tissue of the artery was preserved ; no blood in the capsular membrane, but there is a little pigmented tissue in the artery.

BURNETT.

273. GOLDZIEHER. The relation between opacities of the vitreous and the choroidal affection. *Pesth. med.-chir. Presse*, March 4, 1882. The vitreous body does not derive its nourishment from the chorio-capillaris, but from the ciliary body; more exactly, from the blood-vessels of the ciliary processes. Inflammations of the former membrane are therefore rarely attended by opacities of the vitreous ; of the processes, almost always. In the serous form of choroiditis, which has its most characteristic exponent in specific choroiditis, dense and copious exudations into the vitreous are the rule. The blood-vessels nourishing the vitreous belong to the supra-choroid, and are surrounded by numerous nets of nerves and ganglion cells. The inflammatory process being conducted through these from the ciliary nerves explains the rapid and extensive nutritive disturbance of the vitreous, as it is observed in sympathetic ophthalmia, when it manifests itself early in the form of dense opacities of the vitreous.

VI.—RETINA AND FUNCTIONAL DISTURBANCES.

274. ANGELUCCI. Contribuzione allo studio dell' embolia dell' arteria centrale della retina. *Gaz. med. di Roma*, March, 1882. Embolism of both temporal branches of the central retinal artery. In the upper branch the embolus was situated at the first fork of the artery, close to the edge of the disc, in the lower a little farther down and beyond the beginning of the nasal branch. The amaurosis had been sudden, and included the whole field of vision except a small triangle outward. Two months later the two arteries could scarcely be traced beyond the emboli. The return of large hemorrhoids and hypertrophy of the left ventricle are assigned as the cause. DANTONE.

275. ATKEN, CHAS. Neuro-retinitis from blow on forehead. *Brit. Med. Journal*, Feb. 4, 1882, p, 157. Patient was thrown out of trap, fell on right side, and was insensible for six hours. Had vomiting, epistaxis, and severe headache. On fourth day found he could not see with O. D., and was brought to Liverpool Eye Infirmary. He could not read Jaeger 20. Central vision and inner field quite lost. Optic disc and retina extending to outer margin of macula much swollen and of milk-white color, veins engorged, arteries partially hidden ; macula blood-red, apparently enlarged and triangular in shape, apex

inward. No hemorrhages. O. S. normal. Ophthalmoscopic examination made four months later showed the optic nerve white—" remains of pigmental displacement " (sic),—arteries small, veins irregularly narrowed. Region of macula presented " washed-out-looking " patches on a deeper red ground. No perception of colors. Perception of light in outer field. No central vision. Muscles all acted normally. Pupil sluggish. Sensation normal. FITZGERALD.

276. BULLER, F. Case of sudden and complete loss of vision after large doses of quinine. *Trans. Amer. Ophth. Soc.*, 1881. These ARCH., vol. x, 3. In a healthy woman of 32, septicaemic symptoms developed 5 days after a normal delivery. Doses of 1.20 grms. of quinine were given three times daily. On the fifth day she was free from fever, but totally blind ; the pupils did not react upon light ; the retina was slightly turbid ; four days later there was a slight return of vision. On the eighth day beginning atrophy of the optic nerve was observed. Eleven weeks later V = $\frac{1}{10}$, with a perceptibly contracted field of vision ; at its centre only colors could be recognized. Two years later V = $\frac{1}{10}$, accommodation normal, but absolute peripheric color-blindness. Both optic nerves atrophic. Buller thinks this was a case of retrobulbar perineuritis, caused in some unexplained way by the use of quinine. BURNETT.

277. COUPLAND. Neuro-retinitis after contusion of brain. Ophth. Soc. of the United Kingd. *The Lancet*, No. 12, and *Ophth. Rev.*, vol. i, No. 6, p. 160.

278. DENISSENKO. On detachment of the retina. *Aerztl. Zeitung*, 1882, Nos. 1, 2, 3, 4, and 6. The author rejects the theories of Iwanoff, Klein, Jäger, Coccius, Adamük, and Rählmann in regard to detachment of the retina, especially that of traumatic origin ; he and Schneller point out that these theories do not explain why and under what conditions traumatic detachment is easily cured in one case but remains incurable in the other ; he discards entirely Schneller's conception of the lymph-currents in the retina. He admits that affections of the choroid may influence (though not primarily) the detachment of the retina, but maintains that in the retina itself all the conditions for the development and continuation of this pathological process are given.

Based upon his own histological investigations, Denissenko thus explains detachment of the retina. In chorio-retinitis (sometimes independently), atrophy of the rods and cones gradually sets in, extending from the outer to the inner parts and nuclei. Thus cavities are formed in the outer granular layer, which easily unite to form larger ones, and are only bounded by the limitans externa. An injury easily produces a rent in the latter ; the lymph escapes from the cavities and penetrates between the retina and choroid, detachiug the former. The hyperæmia increases the secretion of the lymph from the retina considerably and thus sustains the detachment.

The detachment is cured when the lymph is prevented from penetrating beneath the retina, either by adhesion of the rods and cones over the rent in the limitans externa, forming an isolated cavity, or by union between the retina and choroid around the rent, with formation of a cavity. The former event is so frequent in owls and horses that the author was at first inclined to consider it a normal condition.

The lymph causing the detachment generally comes from the retina, but sometimes from the choroid ; in the latter case, however, detachment can only take place when the tension in the eye is negative.

The changes in the vitreous are only secondary results of the detachment of the retina. HIRSCHMANN.

279. DENISSENKO. A remarkable case of hemorrhage in the eye. *Wien. med. Presse*, No. 1, p. 14. The globe had been squeezed by an impinging piece of wood, producing dislocation of the lens. A peculiar red spot was discovered with the ophthalmoscope at a retinal blood-vessel, which became perceptibly paler when pressure was exerted upon the globe; the blood-vessel, whether artery or vein could not be determined, seemed to enter this spot. Diagnosis: Aneurism or varix of this blood-vessel.

280. DICKINSON, WM. Embolism of the central artery of the retina. *St. Louis Med. and Surg. Journ.*, Feb., 1882. Four cases are given in detail. In the second case, however, though there was sudden blindness, there is no account of the condition of the retinal vessels. In the others they presented the usual appearance in embolism of the central retinal artery. BURNETT.

281. EALES, HENRY (Birmingham). Primary retinal hemorrhage in young men. *Ophth. Rev.*, vol. i, No. 3, Jan., 1882, p. 41. In each case it was the left eye which was principally and chiefly affected. Vitreous opaque from hemorrhages into it. Often rapid diminution of opacity of vitreous, with a sudden recurrence after a few weeks or months. The hemorrhages in the retina usually almost entirely confined to periphery. Yellow spot not involved in any case. Ultimate result of these repeated extravasations was the formation of large whitish and sometimes glistening patches of degeneration at periphery of retina, with, occasionally, detachment of latter. In no case was retinitis seen to precede or accompany these hemorrhages. The exciting causes appear to have been: the recumbent posture, stooping, coughing, laughing, and especially over-exercise. All the patients were young. All were subject to epistaxis and suffered from constipation. Pulse habitually under 60 per minute. Urine normal. All complained of dyspepsia, low spirits, want of energy, and feeling of lassitude. No evidence of gout in family. Puffiness and discoloration around the eyes often noticed. Variations of local circulation were common *e. g.*, cold feet and hands, and flushings of the face. E., from the evidence of local variations of circulation, from the slow pulse, constipation, flushing of face, headache, and puffiness and discoloration around eyes, is inclined to attribute this combination of conditions to a neurosis affecting both the circulatory organs and the digestive system, leading on the one hand to partial inhibition of the muscular movements of the bowels and to a vaso-motor contraction of the vessels of the alimentary canal, with inhibition of its secretory functions, thereby causing dyspepsia, constipation, and malnutrition; and, on the other hand, to a compensatory dilatation of the systemic capillaries, especially those of the head, and, in these cases, of the retina, causing over-distention of the venous system and systemic capillaries, with liability to rupture on the occurrence of an intensifying cause. The slowing of the pulse he also considers due to a neurosis. He has tried various methods of treatment but without much success, so contents himself with treating the constipation with purgatives, and the dyspepsia with mineral acids combined with bitter tonics. Rest and change of air he has found of most benefit. He has met with no similar cases in females, and suggests that the menstrual function possibly acts as a safeguard. FITZGERALD.

282. GALEZOWSKI. Migraine ophthalmique avec thrombose des vaisseaux rétiniens. *Rec. d' ophth.*, Jan., 1882 ; and ophthalmic migraine, an affection of the vaso-motor nerves of the retina and retinal centre which may end in a thrombosis. *The Lancet*, No. 5, 1882. Among the cases of ophthalmic migraine observed by Galezowski, thrombosis of the retinal blood-vessels was seen in two ; in one, thrombosis with rupture of the retinal blood-vessels ; in one, partial atrophy of the disc, which Galezowski is inclined to refer to thrombosis of the cerebral blood-vessels of the optic nerve. The clinical history of the four cases is reported, from which Galezowski concludes that occasionally ophthalmic migraine may produce palpable changes in the retinal and cerebral blood-vessels. MARCKWORT.

283. HIRSCHBERG. On amblyopia from iodoform intoxication. *Sitzungsber. d. Berl. med. Ges.*, Mar. 15, 1882. *C. f. A.*, vol. vi, p. 93. In a young girl of 16, upon whom a resection of the hip-joint had been performed, and who had been treated for weeks with iodoform, a central scotoma was observed, the visual field being otherwise normal, and no ophthalmoscopic change visible. V—$\frac{1}{15}$. After removal of the bandage, V rose within 8 days to $\frac{1}{2}$.

284. MICKLE, W. JULIUS. Case showing the localization of the visual centres in the cerebral cortex. *Med. Times and Gazette*, Jan. 28, 1882. M., æt. 65, totally blind for many (probably more than 20) years from corneal disease, died of pleurisy, with erysipelas of the face, three months after onset of acute mental disease. Other special senses normal. *Post-mortem.*—Moderate general atrophy of brain-cortex. Well-marked atrophy of optic nerve and tract, and of upper part of supramarginal gyrus, and, to a less degree, of angular gyrus on both sides ; patches of red softening, with dilatation and infarction of small vessels in 1st and 2d occipital convolutions on both sides. *The supramarginal wasting was the most marked.* Corpora geniculata, corpora striata, and optic thalami more or less wasted. The case shows, says M., that the cortical visual centres are not localized solely either in the anguli gyri or the occipital lobes. E. NETTLESHIP.

285. DEL MONTE. Treatment of detachment of the retina. *Atti dell' ass. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. Artificial leeching is useless in old cases, in recent ones even injurious. The effects of injections of pilocarpine should not be overrated. In favorable cases the effect becomes apparent after the first injection. DANTONE.

286. MORANO. Caso di distacco retinico. *Giorn. delle mal. degli occhi*, vol. v, Feb., 1882, and *Atti dell' ass. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. A detachment of the retina which had existed for 3 weeks was partially cured by the use of Heurteloup's artificial leech, Zittmann's decoction, and, later, calomel and opium. DANTONE.

287. PONCET. Rétinite tabétique. *Compt. rend. hebd. des séances de la soc. de biol.*, No. 8.

288. ROOSA, D. B. ST. JOHN. Case of hemorrhage near the macula lutea, from concussion. *Trans. Amer. Ophth. Soc.*, 1881. These ARCHIVES, vol. x, 3. A bullet had passed through the lachrymal sac, nose, and cheek into the region of the glenoid cavity. At the last examination there was only peripheric vision — $\frac{16}{100}$. The eye was myopic. Crossed diplopia. Roosa assumes con-

cussion of the retina, though it is doubtful whether the paresis of the oculo-motor nerve can be assigned to the same cause. BURNETT.

289. SCHÖLER. Cases of hemianopic defects. *Annual Rep. of his Ophth. Clinic* for 1881, Peters, 1882, p. 30, ff. 1. Left-sided homonymous hemianopia from syphilis; partial recovery. Diagnosis: gumma between the chiasm and beginning of the optic nerve. 2. Heteronymous temporal hemianopia in a person of 25 with normal field of vision; without any apparent cause, only heredity; no cerebral symptoms. After the use of iodide of potash slight change in the boundary line of the visual field. Later, incipient atrophy of the optic nerve was observed. 3. Left-sided hemianopia in course of recovery; cause syphilis. Rapid improvement under inunction.

290. UHTHOFF. Congenital affections of the retina and optic nerve. *Ann. Rep. of Schöler's Ophth. Clinic* for 1881. Peters, 1882. Cases and statistics, p. 8.

291. WEINBERG (Hirschberg's clinic). On diathetic retinitis. *C. f. A.*, vol. vi, p. 65. 1. Retinitis in glycosuria and albuminuria. In two cases there were very characteristic changes in the fundus. No choked disc, numerous groups of shining white patches, though they did not show any stellate arrangement. 2. Retinitis from chronic lead-poisoning: *a*, in a type-moulder. Amblyopia of the right eye. Fingers counted at 8′. Normal field of vision in both eyes. The ophthalmoscope showed neuro-retinitis, numerous white punctiform spots in the retina, besides minute hemorrhages, perceptible thickening of the walls of the arteries. *b*, in a porcelain-glazer. Diffuse retinitis with central scotoma. Recovery.

292. WOOD-WHITE (Birmingham). Embolism of arteria centralis. Re-establishment of circulation witnessed with the ophthalmoscope. *Ophth. Rev.*, vol. 1, No. 3, Jan., 1882, p. 49. A young man, æt. 31, the morning of his visit to the hospital, perceived a cloud pass before his right eye, and in a few minutes the vision in this eye was totally lost. With the ophthalmoscope the fundus presented the characteristic appearances of embolism of the central artery. There was not the slightest perception of light. W. made pressure with his finger on the globe for the purpose of ascertaining whether there was any pulsation of the vessels, but without result. On repeating the pressure he was surprised to see the circulation suddenly re-established. The patient exclaimed that he could see. V=$\frac{20}{40}$. Field of vision slightly contracted in upper part. This continued. Two days later all œdema of retina had disappeared. V=$\frac{20}{20}$. No history of rheumatism, scarlatina, or syphilis. Cardiac examination showed marked impulse and slight systolic bruit at apex. W. thinks it was most probable that the embolus was lodged in the retinal artery at its point of bifurcation, and that not unlikely the pressure applied to the globe may have assisted in dislodging it, and that it passed forward to some peripheral portion of the retina. FITZGERALD.

VII.—OPTIC NERVE.

293. DRESCHFELD, J. Pathological contributions as to the course of the optic nerve fibres in the brain, *Brain*, vol. iv, 543, and vol. v, 118 (Jan. and April, 1882). 1, M., 40. L. hemiparesis, hemianæsthesia, and hemianopsia. Smell and taste normal. Fundus normal in each eye. Death, after occurrence of mental symptoms, 2 years from onset of symptoms. Diffused sarcomatous

tumor in posterior part of R. internal capsule, optic thalamus, lenticular nucleus, and anterior of the corpora quadrigemina; flattening and softening of R. optic tract, at base of brain, from pressure. D. records the case as strongly supporting the theory of partial decussation of the optic fibres at the chiasma. (The hemianopsia is stated to have been "exact and total" though "central vision is normal."—REV.) 2, F., 50. Sudden L. hemiplegia and hemianopsia, with slight hemianæsthesia; other special senses normal. Death from fresh apoplectic attack two weeks later. Small circular hemorrhage 8 *mm.* × 6 *mm.* in postero-upper part of R. optic thalamus ("the part described as the pulvinar"); rest of thalamus normal; corp. quadrigem., corp. geniculat., and optic tract normal. Several other localized hemorrhages in R. centrum ovale, accounting for the hemiplegia. Fresh hemorrhage under L. lobe of cerebellum, accounting for fatal attack. The pupils were normal to light; this, D. thinks, favors the view that the reflex centre for the iris is not situated either in the cortex or in the thalamus, but probably in the anterior corp. quadrigem. The hemianopsia did not reach quite so far as the fixation point. 3. M., 52. Chronic Bright's disease with neuro-retinitis. Sudden L. hemiplegia, hemianæsthesia, and hemianopsia (complete), with amblyopia due to changes visible in eyes. Subjective symptoms did not change during next 6 months, when he died of a second cerebral hemorrhage. Very extensive hemorrhage within R. hemisphere, destroying the basal ganglia, but the corpus geniculatum and optic tract perfectly healthy and at a distance from the hemorrhage. Cortex cerebri perfectly intact. E. NETTLESHIP.

294. LAWFORD. Double optic neuritis following purpura. Ophth. Soc. of Great Britain. *The Lancet*, No. 4.

295. NETTLESHIP. Atrophy of optic disc after phlegmonic erysipelas of orbit. Ophth. Soc. of Great Britain, March 9, 1882. *Ophth. Rec.*, vol. i, No. 6, p. 157. *The Lancet*, No. 12.

296. TUCKWELL. Paralysis, probably syphilitic, affecting in rapid succession both arms; impaired vision; optic neuritis, gradual recovery under taking of large doses of iodide of potassium. *The Lancet*, 1882, No. 2.

297. TAY, WARREN. Double optic neuritis after injury of head. *Ophth. Rev.*, vol. i, No. 6, p. 159. *The Lancet*, No. 12.

298. WESTRUM. Observations of so-called choked disc in dogs. *Zeitschr. f. vergleich. Augenheilk.*, of Berlin and Eversbusch. Leipzig, Vogel, vol. i, p. 37. The ophthalmoscope showed the cause of amaurosis in two dogs, one of whom had probably become blind from quinine, to be choked disc in both eyes, presenting the same appearance as in man.

VIII.—INJURIES, FOREIGN BODIES (PARASITES).

299. LAMBERT, C. A. Injuries of the eye. *Chicago Med. Journ. & Exam.*, Feb., 1882. Traumatic aniridia, paralysis of all the muscles of the eye, and loss of vision; paralysis of all the muscles of the eye and lids, and some other less important cases. BURNETT.

300. MANDELSTAMM, E. Injury of both eyes by a pistol-ball. *C. f. A.*, vol. vi, p. 9. It entered at the right temple, *i. e.*, eyebrow, and passed out at the left temple near the beginning of the hair. Right side: ptosis, diminution

of mobility upward and outward, amaurosis; the ophthalmoscope showed detachment of the retina and rupture of the choroid above. Left side: no paralysis, detachment of the retina, also a rent in the choroid, and a smaller one below. Fingers counted at 8′. Total loss of the sense of smell.

301. MAYERSHAUSEN. Cases of visual disturbance after injuries of the skull. *C. f. A.*, vol. vi, p. 44. Fall upon the left supra-orbital region; unconsciousness, profuse epistaxis. Four weeks later atrophy of optic nerve, arteries much contracted, veins about normal, amblyopia, scotoma upward and outward. Diagnosis: fracture of the base of the skull affecting also the roof of the orbit resp. the optic canal; compression of the inner lower fibres of the optic nerve.

302. MENGIN (de Caen). Observations cliniques. *Rec. d' ophth.*, Jan., 1882. Reports two clinical cases: 1. Detachment of the whole lower half of the retina, due to an injury; complicated with a rent in the cornea, paralysis of accommodation, as well as the sphincter and pupil, and retinal hemorrhage. Recovery in two months. The author advises iridectomy in detachment of the retina from choroiditis in myopia. 2. Foreign body in the choroid, traumatic cataract; a reddish stone visible upon the choroid after extraction, and borne well; V = $\frac{3}{10}$; large scotoma corresponding to the foreign body.

MARCKWORT.

303. NICOLINI. Cecità immediata permanente unilaterale successiva a trauma diretto sul bulbo. *Ann. d' ottalm.*, vol. x, 6, p. 422. A girl of 22 struck her left eye against a projecting iron rod and lost her sight immediately after it. The pain was slight and the patient only had the feeling of pulsation in the eye. The following day the eye was examined, and a small ecchymosis found upon the nasal side of the upper lid and the corresponding spot on the globe, pupil immovable; otherwise every thing normal, including the interior; V = O. Five months later he saw the patient again; the optic nerve had become atrophic, otherwise nothing abnormal; V still = O. DANTONE.

304. OELLER. A splinter of wood. *C. f. A.*, vol. vi, p. 18. It was 8 *mm.* long, and had remained in the eye for 17½ years without causing any reaction, as it probably had lain parallel to the longitudinal axis of the globe, behind the upper edge of the external rectus; then in consequence of an inflammation it had placed itself at right angles to its former position, had penetrated the globe, produced irido-choroiditis, and was found when extracted 8–9 *mm.* behind the outer edge of the cornea, at the upper edge of the external rectus, perpendicular to the longitudinal axis of the globe. Preservation of the globe and some vision.

305. RAVÀ. Casuistica clinica. Pallino da caccia perduto nell' orbita, accenno oduna simpatica affezione. *Ann. d' ottalm.*, vol. x, 6. A grain of shot penetrated the globe 7 *mm.* from the upper inner edge of the cornea, passed out again 1 *cm.* farther back, and was lost in the orbit. After eight days vision had been totally destroyed; two weeks later symptoms of sympathetic irritation were observed in the other eye, which disappeared after enucleation; the scars of the entrance and exit of the grain were found in the enucleated eye, but the shot itself could not be found in the orbit. DANTONE.

IX.—OCULAR AFFECTIONS IN CONSTITUTIONAL DISEASES.

306. BEEROR. On conjugate lateral deviation of the eyes directly after epileptic fits. *Brit. Med. Journ.*, Jan. 21, 1882, p. 85. Dr. Beeror has observed this in eleven out of the last thirteen fits which he has witnessed. He thinks it may be explained by the theory, that the side on which there was the greater motor discharge, as shown by the initial rotation of the head, becomes at the end of the fit the more exhausted and suffers more paralysis than the other side.

FITZGERALD.

307. BUZZARD, J. On ophthalmoplegia externa, in conjunction with tabes dorsalis, with remarks on gastric crises. *Brain*, April, 1882, pp. 34–55. 1. F., 25, double ophthalmoplegia externa with partial mydriasis (pupils 4–5 *mm.*), gastric crises, paroxysmal limb-pains, absence of knee reflex, etc. Syphilis at æt. 17. 2. M., 36. Pains for five years. Decided tabetic symptoms six months; followed by ophthalmoplegia externa, quite complete; deafness and dysphagia. No optic atrophy. Death after attacks of dyspnœa. Neither of the sixth nerves nor L. third nerve could be found; other cranial nerves normal. Atrophy of nerve elements, with dilatation, plugging, and rupture of minute vessels, at nucleus of origin of 6th nerve. Advanced degenerative changes in posterior columns of cord. Nuclei of the bulbar nerves normal, (histological examination by Dr. Bevan Lewis). Comments on the cases.

E. NETTLESHIP.

308. CALMETTES, R. De l' ophthalmoscopie dans les maladies des oreilles. *Progr. méd.*, vol. iii, p. 44, 1882.

309. COHN, H. Ocular affections from masturbation. *A. f. A.*, vol. xi, 2, p. 198. He mentions, citing cases: 1. Photopsia, the eyes being otherwise normal. 2. Inflammations, resp. hyperæmia of the conjunctiva. 3. Blepharospasm. 4. Hyperæmia of the optic nerve. Also amblyopia, weakened power of accommodation, morbus Basedowii. (To appear in next number in these ARCHIVES.)

310. CONTI thinks he has observed a special form of iritis from malaria in himself and others. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. DANTONE.

311. DRESCHFELD, J. Two cases of acute myelitis associated with optic neuritis. *Lancet*, January 7, 1882.

CASE 1.—F., 38, paraplegia of lower limbs and paresis of upper limbs coming on after exposure to cold. Double optic neuritis (without impairment of V) discovered three weeks after onset of symptoms. Other cerebral nerves normal. Death, from paralysis of diaphragm, 6 weeks after onset of symptoms. *Post-mortem:* Transverse myelitis for 1¼ inches (3.5 *cm.*) in cervical region of cord; intense congestion of brain and its membranes. Serous fluid in the sub-vaginal space of optic nerve.

CASE 2.—M., 41, intemperate; probably had syphilis many years ago. *October.* Failure of V and weakness of legs; optic neuritis soon passing into atrophy and complete blindness. Complete paraplegia and varying mental condition with some delirium, passing into semi-coma. Extension of paralysis upward. Death 6 weeks after onset of symptoms. Patellar reflex, at first rather increased, entirely disappeared a few days before death. *Post-mortem:* Dis-

seminated acute myelitis, of different dates, in various parts, most intense in mid-dorsal and upper lumbar regions. Brain healthy. Careful microscopical examination. E. NETTLESHIP.

312. ELY, E. T. Illustrative cases of disease of the eye, arising from affections of the teeth. *N. Y. Med. Record*, March 11, 1882. E. relates the following cases in which he believes the ocular troubles to depend on diseased teeth. Case 1. Paresis of orbicularis muscle, irregular spasm of ciliary muscle, monocular diplopia. Case 2. Paresis of R. int. rect. and ciliary muscles. Case 3. Partial paralysis of 3d nerve. Case 4. Inflammation of conjunctiva and sclera. In all these cases the eye troubles disappeared immediately on the correction of the dental difficulty. BURNETT.

313. HORNER. Hereditary syphilis and its relation to ocular affections. *Corr.-Bl. f. Schweiz. Aerzte*, No. 3, 1882, p. 48. As results of it, clearly different from those due to scrofula, rhachitis, and tuberculosis, the following affections may be cited. 1. Diffuse interstitial keratitis, which may be considered a disease invading the source of nutrition of the cornea; it is frequently complicated with an affection of the uveal tract—the real seat of hereditary syphilis in the eye,—and of the vitreous. 2. Specific iritis and chorio-retinitis, the latter generally being confined to one eye. Horner also gives the statistics of some of the consequences of hereditary syphilis: 1, scars and eruptions in 27%; 2, dental affections in 20%; 3, periostitis in 27%; 4, glandular scars in 25%; 5, ozæna and lachrymal fistulas in 20%; 6, aural diseases in 12%; 7, affections of the gums in 10%; 8, prurigo in 8%.

314. HUTCHINSON, J. Case of anomalous nerve disorder in infancy. *Brit. Med. Jour.*, March 11, 1882, p. 342. Mr. Hutchinson exhibited this curious case at the Pathological Society of London, where he had already shown it seven years previously. One eye had been excised in infancy for supposed new growth, which, however, turned out to be an inflammatory material between the choroid and retina. Sight in other imperfect, with nystagmus. In his remarks H. mentioned having seen a child who, a few days after birth, was found in a condition of cold and shock; here paralysis, but not destructive lesions of both eyes followed. In another similar case he had seen symmetrical cataract occur. FITZGERALD.

315. JANY, L. Case of right-sided hemianopsia and neuro-retinitis due to a gliosarcoma in the left occipital lobe. *A. f. A.*, vol. xi, 2, p. 190; 2 woodcuts. Girl of 21, who had suffered formerly from rheumatism of the joints, had been ill for 5 months with cerebral symptoms, but without any psychical disturbances. Choked disc in both eyes, loss of the right half of the visual field, but the boundary line does not lie exactly in the middle. No other symptoms of local lesion. Death during coma. *Post-mortem*: tumor in the region of the left lambdoid suture, projecting, exactly at the apex of the left cerebral lobe, extending forward as far as the sulcus parieto-occipitalis. Cystoid degeneration in the white substance of the posterior part of the parietal and occipital lobes. It proved to be a gliosarcoma. No other local lesions.

316. LANDESBERG, M. The eye and sexual excess. *Med. Bull.*, vol. xi, 1, p. 6.

317. LANGER (Duchek's clinic). Cases of cerebral tumors. *Wien. med. Presse*, No. 4, p. 116, and No. 6, p. 176. 1. Tumor of the pons Varolii in a

woman of 26. Cerebral and psychical disturbances, paresis of the left facial nerve, no fixation with the left eye, paresis of the left abducens, later also of the right internal rectus (associated paralysis). Choked disc in both eyes. Pupils equally wide; death during coma. 2. In a man of 41 suffering from headache, troubled speech, etc., impairment of sensibility of the right side of the body and of taste on that side. Paralysis of the right internal rectus and left external rectus. Right pupil wider than left. No visual disturbance or hemianopsia; ophthalmoscopic appearance normal. *Post-mortem;* tubercle the size of a hazel-nut in the right side of the pons.

318. LITTEN. The relation of diseases of the liver to retinal affections. Sitzungsber. d. Ver. f. inn. Med., Feb. 20, 1882. *Deutsche med. Wochenschr.*, No. 13, p. 170.

319. MACKENZIE, STEPHEN. Headaches in children. *Brit. Med. Journ.*, Mar. 4, 1882, p. 307. In the discussion which followed on a paper by Dr. Day at the Harveian Society, Dr. Stephen Mackenzie drew attention to the importance of careful examination of the eyes in cases of headache in children.

FITZGERALD.

320. NETTLESHIP. Chorio-retinitis in inherited syphilis. Ophth. Soc. of Gt. Britain. *The Lancet*, No. 12.

321. NOTHNAGEL. Case of cerebral tumor. *Wien. med. Bl.*, 1882, No. 1. Tumor in the corpora quadrigemina of a girl of 22. The cerebral affection had lasted a year. Vision had first decreased in the right eye, then the left facial nerve had become paretic. Half a year later total amaurosis in the right eye, amaurotic amblyopia in the left. Neuro-retinitis in both eyes. Eyes movable downward only; impairment of sensibility in the left arm. *Post-mortem:* glioma of the corpora quadrigemina, a part of the base of the fourth ventricle, and the corpora restiformia.

322. ORSI. Exoftalmia doppia da meningite basilare exsudativa-suppurativa. *Gaz. med. ital. Lombard.*, No. 1. Gennaio, 1882.

323. PONCET. De l'état du nerf optique et de la rétine chez un ataxique aveugle depuis 18 ans. *Progr. méd.*, No. 8.

324. POSSADSKY. Pathological changes in the retina in some constitutional diseases. *Diss.*, St. Petersburg, 1882, 27 pages. The author reviews his pathological investigations as follows: 1. In all forms of typhoid fever there is hyperæmia of the retinal blood-vessels, and granular opacity of the 3d, 5th, 7th, and 9th retinal layers (of different intensity in the different kinds of fever). 2. In chronic pneumonia: hyperæmia, hypertrophy of the connective tissue, granular opacity of the 3d, 5th, and 7th layers, and occasional pigmentation of the stroma and the ganglion cells. 3. In croupous pneumonia: serous infiltration of various parts. 4. In peritonitis: hyperæmia, infiltration of the tissue with white blood-corpuscles, and opacity and swelling of the 3d, 5th, and 7th layers. 5 and 6. Meningitis and pyæmia: hyperæmia with extravasation, blood-corpuscles, infiltration of the tissue, opacity of the 3d, 5th, and 7th layers (less marked in pyæmia). 7. In uræmia: hyperæmia with extravasation, cellular infiltration of the tissue, slight haziness of the nervous elements. When the ureters were ligated: serous infiltration of the retina. 8. In chronic alcoholism: hyperæmia with extravasation and cellular infiltration, hypertrophy of the connective tissue,

coarse granular opacity of the 3d, and fine granular opacity of the 5th and 7th layers. 9. In jaundice from cirrhosis of the liver: hyperæmia, hypertrophy of the connective tissue, and fine granular opacity of 3d, 5th, 7th, and 9th layers. 10. In pleuritis with pericarditis: no changes in the retina.

325. SAUNDERS. Case of optic disturbance probably from intracranial tumor. *Brit. Med. Journ.*, Jan. 25, 1882, p. 116. O. D. Paralysis of 6th and paresis of 3d nerves. Argyll Robertson's symptom (contraction of pupil on convergence, but not on direct exposure to light) well marked. Optic neuritis, myopia. O. S. Paralysis of 3d; hypermetropia. Author discusses Argyll Robertson's views, and concludes that the cause of the symptoms in this case was the existence of multiple tumors, probably syphilitic gummata, involving the nerves at the base of the brain. FITZGERALD.

326. VELARDI and RIBOZZI, who live and practise in malarious regions, have never observed ocular affections which could be brought into direct connection with the miasm. *Atti dell' assoc. ottalm. ital.*, Sept., 1881. *Ann. d' ottalm.*, vol. x, 6. DANTONE.

SHORT REPORT ON THE 18TH ANNUAL MEETING OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY, HELD AT LAKE GEORGE ON JULY 26 AND 27, 1882.

BY H. KNAPP.

Since the "systematic report on the progress of ophthalmology" has been so enlarged as to embrace the whole current ophthalmological literature, it would lead to repetition to publish, as heretofore, extensive reports of the sessions of the leading ophthalmological societies of this country and Europe. Short reports, however, may as items of news not be unwelcome to our readers, and from this point of view the subjoined is offered.

The meeting was called to order at 10 A.M. by the Chairman, Dr. H. D. Noyes, of New York.

Papers were read in the following order:

1. C. S. BULL, of New York. *A case of pulsating vascular tumor of the orbit, eyelids, and vicinity.* Repeated application of electrolysis checked only temporarily the growth of the tumor.

2. W. W. SEELY, of Cincinnati. *a.* On *a case of remains of hyaloid system, with attachment to the lens and detachment from the papilla.* *b.* On *a case of temporary loss of vision from serous effusion into the vitreous, probably due to malarial poisoning; recovery.* He was positive that the effusion was not hemorrhagic

though an oculist who saw the patient first had said that the eye was full of blood. No kidney disease present.

3. R. J. McKay, of Wilmington, Del. *a. A case of disappearance of the iris after cataract-extraction. b. A case of non-pulsating exophthalmos with recurring thrombosis of the orbital veins.* The protrusion began in the right eye of a female patient at 10 years of age, increased slowly, was more marked during menstruation. After marriage and child-birth irido-choroiditis with sloughing of cornea set in; globe enucleated. The orbit was filled with a mass of veins, feeling like a varicocele. Threatening symptoms of purulent infection for some weeks; then disappeared. At subsequent menstrual periods repeated attacks of thrombosis in orbit. Finally complete recovery.

4. A paper by W. F. Norris, of Philadelphia, on *hereditary atrophy of optic disc*, was read by Dr. Harlan. Incident cases were reported in the discussion.

5. W. S. Little, of Philadelphia. On *faradization in opacities of the vitreous.* Reports four cases, and speaks in favor of this mode of treatment.

6. C. S. Merkill, of Albany. On *a case of retinal glioma in a patient of 21 years of age.* The microscopic examination of the removed eye showed simple glioma. No relapse these four years, but patient "now very low with phthisis, which began to develop about a year ago."

7. John Green, of St. Louis. *a. A case of ruptured zonula with remaining accommodation. b. Enucleation with removal of tarsal cartilages and conjunctival sac.* Three such operations performed for epithelioma, two by himself, and one by A. Alt, of St. Louis. The whole conjunctiva was removed; the wound healed by granulation; the orbit was covered with skin, a linear cicatrix indicating the palpebral fissure. *c. Remarks on the operation for entropium*; gives details of his methods as described at previous meetings of this Society. Drs. Prout and Noyes speak in favor of the operation.

8. R. H Derby, of New York. A *case of anæsthesia of the retina with concentric limitation of the visual field in both eyes.* No change for two months under various treatment, but complete recovery in ten days after daily inhalations of three drops of nitrite of amyl. In the discussion the use of nitrite of amyl was spoken of by Harlan, Noyes, and Risley; results inconstant.

9. S. Theobald, of Baltimore. *a.* A *case of circumscribed*

defect of the lens, the remainder being normal in transparency. b. A fragment of glass in the eye, probably the ciliary body, for ten years, without producing serious consequences. Similar cases reported by Green, Pooley, Knapp, Noyes, and Kipp.

10. G. HAY, of Boston. A case of *extensive hemorrhage between sclerotic and choroid.* It simulated an intra-ocular tumor. The eye was removed and the error recognized. Dr. Knapp refers to a similar case, described in his "Intra-ocular tumors."

11. G. C. HARLAN, of Philadelphia, described a simple test for *simulated monocular blindness.* Let the patient read fine type near by through a strong convex lens placed before the good eye, then let him read large type at a distance without removing the glass. If he can read it, it must be with the other eye.

12. W. S. LITTLE, of Philadelphia. A case of *persistent hyaloid artery.*

13. F. BULLER, of Montreal, related a case of *peculiar alopecia ciliarum,* and demonstrated the cilia. Under the microscope a fungus-like substance was seen winding around the hairs like a cord, as a parasitic plant winds around a tree.

14. H. D. NOYES, of New York. *a. Aids in the removal of foreign bodies from the eye.* A + $2\frac{1}{2}''$ lens is held by a fork, the stem of which has a ring into which a finger of the hand holding the lids open is passed. This lens serves to illuminate the foreign body; another lens, fastened to a finger of the other hand, magnifies it. *b. Reduction of size and tension of eyeball by total evulsion of the iris and neurectomy. c.* Three cases of *tumor of the eye.*

15. H. KNAPP, of New York. On *metastatic choroiditis.* First reported the case of a girl who by exposure during her menstruation contracted metritis, transient irido-choroiditis of one and destructive purulent irido-choroiditis of the other eye. Then he spoke of the metastatic choroiditis in cerebro-spinal meningitis, and expressed his opinion that the fully developed cases of metastatic choroiditis always lead to the destruction of the eye, but that also milder cases occur in which the eye, with retention of good sight, is preserved.

16. GEO. C. HARLAN, of Philadelphia. *Case of sarcoma of the lachrymal gland;* exophthalmus, extirpation of growth, preservation of eye. Microscopic examination showed the tumor to be a spindle-celled sarcoma. In the discussion, Dr. Knapp observed that he had recently removed a similar tumor of the lach-

rymal gland, which—different from all he had seen before—was likewise a sarcoma. Extirpation; healing *per primam*; preservation of globe and sight.

17. C. J. KIPP, of Newark, N. J. A case of *acute inflammatory glaucoma, followed by fatal cerebro-spinal meningitis.* Dr. K. thought that the glaucoma resulted from the cerebral disease.

18. S. B. ST. JOHN, of Hartford, Conn. *a.* A case of *glaucoma fulminans* in both eyes. The first eye iridectomized on the 3d day; outbreak of glaucoma in the other eye the second day after the operation. Eserine no benefit. Iridectomy 36 hours after the onset. Recovery in both. *b. Removal of a particle of iron from the lens by means of the magnet.* Three months after the injury the cataractous lens was extracted. After the section with a Graefe's knife, the point of a Grüning's magnet was introduced as far as to touch the superficially situated fragment of iron, and brought it out. The cataract was then removed in the usual manner.

After several papers had been read by title, the society adjourned, to meet again, under the presidency of Dr. H. D. Noyes, at the Kaaterskill House, in the Catskill Mountains, N. Y., on the third Wednesday of July, 1883.

MISCELLANEOUS NOTES.

Prof. Junge of St. Petersburg has resigned his position at the military academy in that city. Dr. Dobrowolski has been proposed as his successor.

Increased opportunities for the study of ophthalmology are offered by several newly organized post-graduate medical colleges, viz:

1. The NEW YORK POST-GRADUATE MEDICAL SCHOOL. Dr. D. B. St. John Roosa, professor; Dr. Edward T. Ely, associate professor; and Dr. S. S. Burt, instructor of diseases of the eye.

2. The COLLEGE FOR MEDICAL PRACTITIONERS OF ST. LOUIS, MO. Dr. Wm. Dickinson, professor of theoretical and practical ophthalmology.

3. POST-GRADUATE INSTRUCTION AT THE UNIVERSITY OF PENNSYLVANIA, Philadelphia. Ophthalmology, by Professor Norris and Dr. Risley.